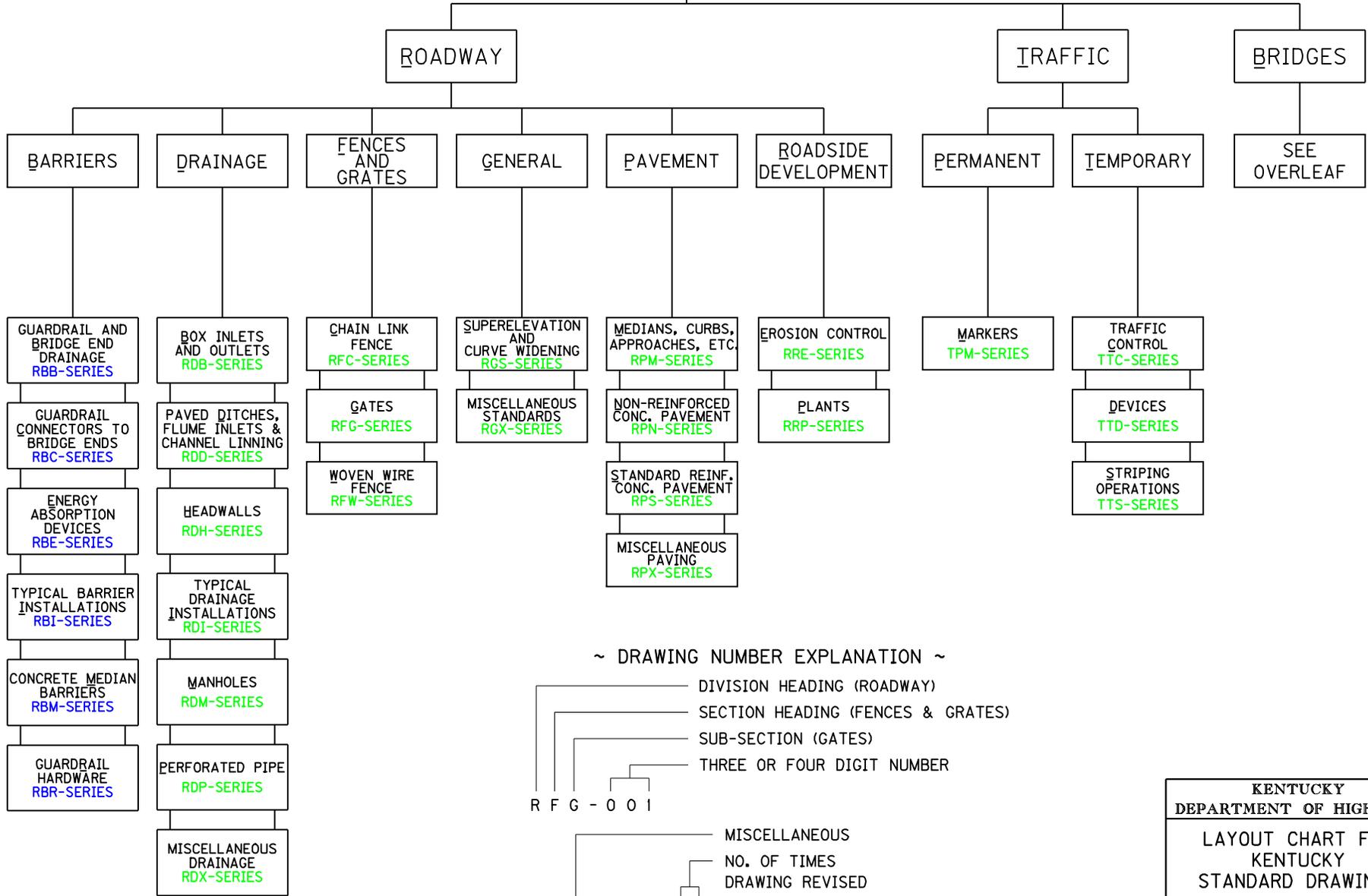
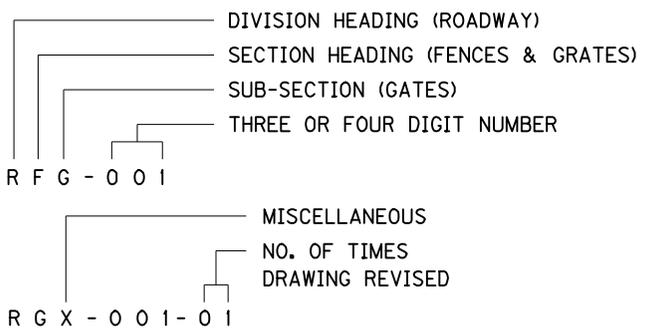


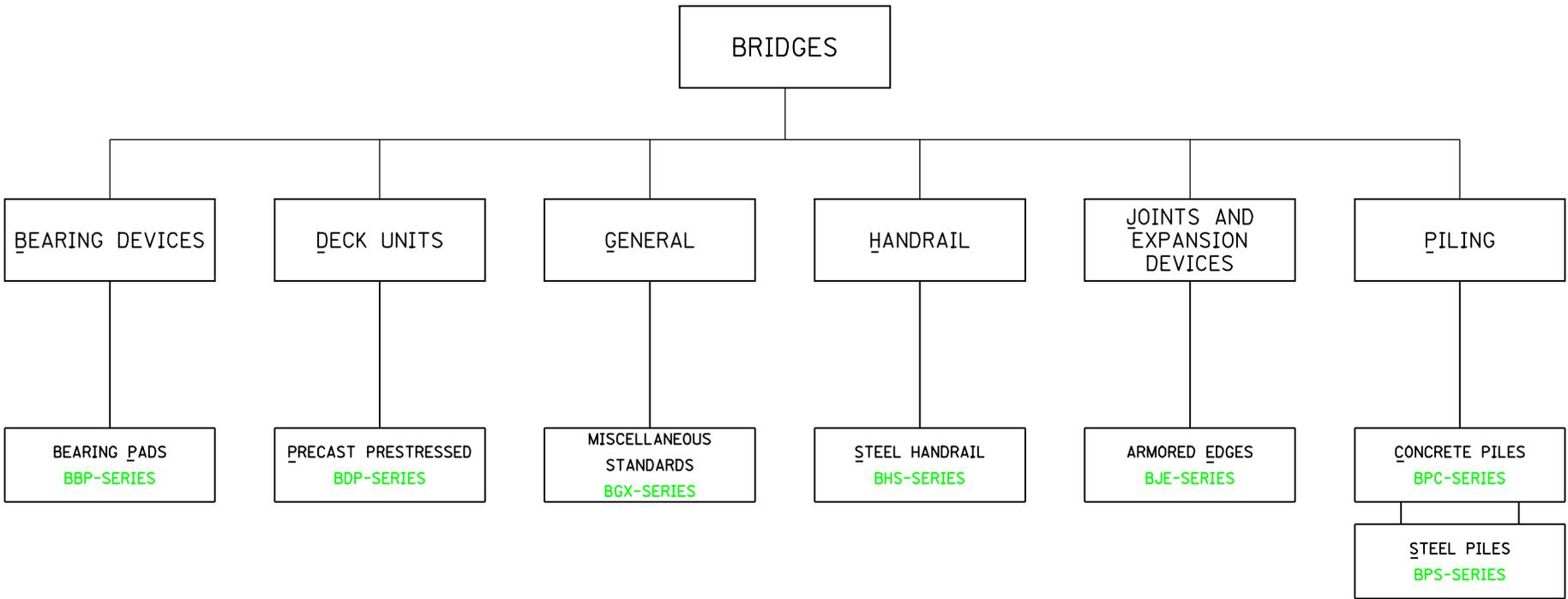
KENTUCKY STANDARD DRAWINGS



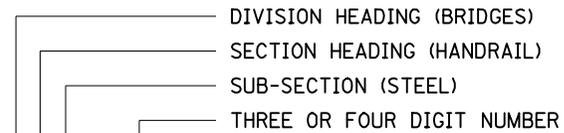
~ DRAWING NUMBER EXPLANATION ~



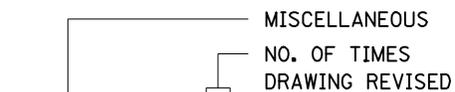
KENTUCKY
DEPARTMENT OF HIGHWAYS
 LAYOUT CHART FOR
 KENTUCKY
 STANDARD DRAWINGS



~ DRAWING NUMBER EXPLANATION ~



B H S - 0 0 1

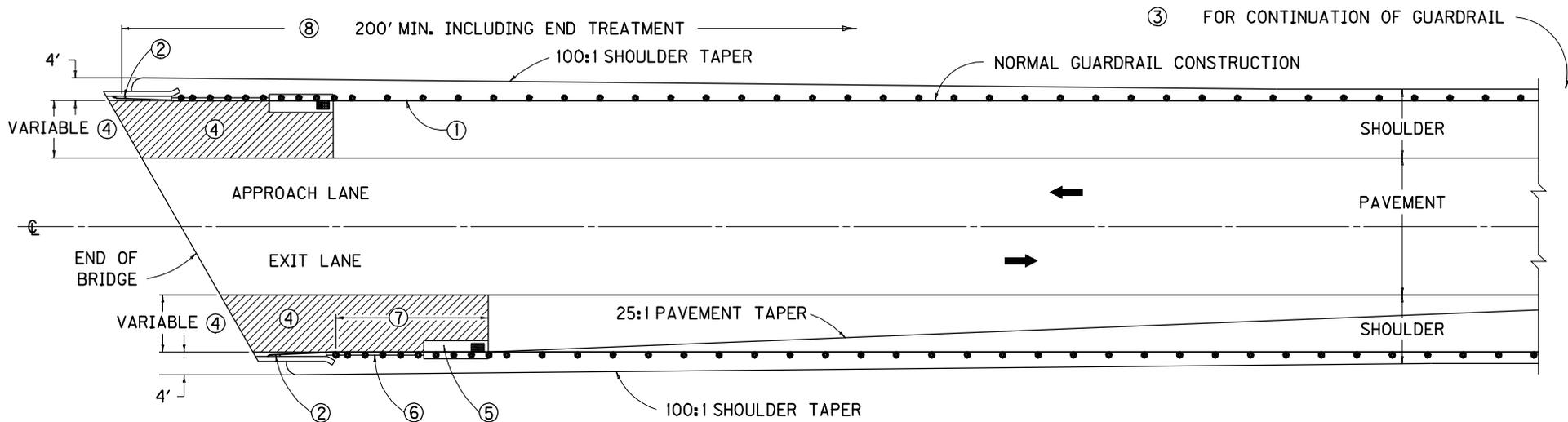


B G X - 0 0 1 - 0 1

KENTUCKY
DEPARTMENT OF HIGHWAYS

LAYOUT CHART FOR
KENTUCKY
STANDARD DRAWINGS

2003

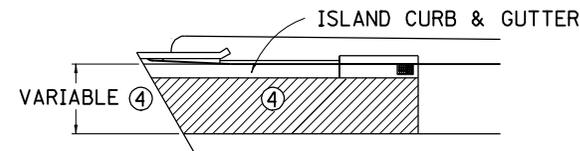


NOTES

- A. NO ANGLES PERMITTED IN NORMAL GUARDRAIL ALIGNMENT.
- B. THIS ILLUSTRATION IS FOR TWO-WAY TRAFFIC FLOW. FOR ONE-WAY TRAFFIC FLOW, MAKE THE FOLLOWING ALTERATIONS:
 - APPROACH END OF STRUCTURE-
 - A. NO PAVEMENT TAPER REQUIRED
 - B. ALIGN FACE OF GUARDRAIL WITH STRUCTURE GUTTERLINE
 - EXIT END OF STRUCTURE-
 - A. PAVEMENT TAPER REQUIRED FOR BOTH OUTSIDE LANES
 - B. FOR GUARDRAIL ALIGNMENT SEE BRIDGE END CONNECTOR DRAWINGS

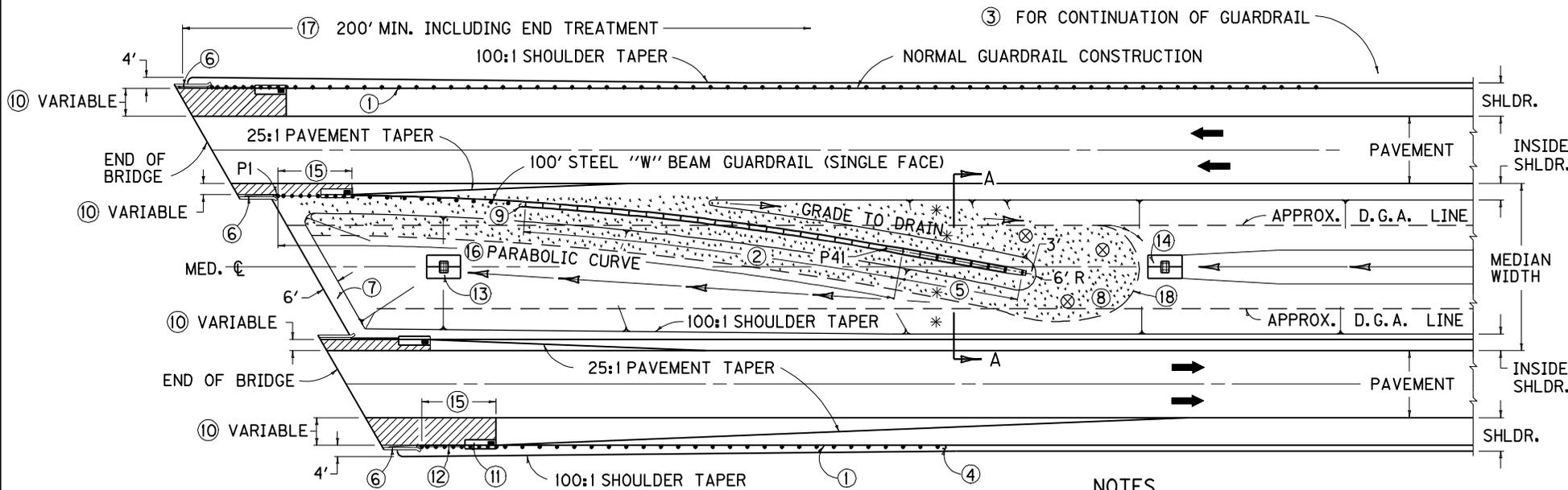
ITEM	STD. DWG. NO. (CURRENT EDITION)
① STEEL W BEAM GUARDRAIL (SINGLE FACE)	RBR-001
② BRIDGE END CONNECTORS	RBC-SERIES
③ END TREATMENT TYPE 1, 2A, 3 OR 4A	RBR-SERIES
DRAINAGE ITEMS (WHEN REQUIRED)	
④ BRIDGE END DRAINAGE AREA	
⑤ CURB BOX INLET TYPE B	RDB-SERIES
⑥ ISL. INTERGAL CURB OR ISL. CURB AND GUTTER	RPM-SERIES

- ⑦ VARIABLE LENGTH, SEE APPLICABLE "BRIDGE END CONNECTOR" DRAWING.
- ⑧ SHOWN FOR FILL CONDITION. LENGTH MAY BE REDUCED SHOULD FIELD CONDITIONS WARRANT.
- ③ TO TERMINATE GUARDRAIL INSTALLATION:
 - A. ALL FILLS; ALSO SOLID ROCK CUTS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL, USE END TREATMENT TYPE 1.
 - B. SOLID ROCK CUTS WITHOUT ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL, USE END TREATMENT TYPE 2A.
 - C. EARTH CUTS AND SOFT ROCK CUTS, USE END TREATMENT TYPE 3.
 - D. ALL FILLS; ALSO SOLID ROCK CUTS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL, USE END TREATMENT TYPE 4A.
- ④ WHEN THIS DIMENSION IS 6'-0" OR GREATER USE CONCRETE PAVEMENT (8" JOINTED PLAIN CONCRETE PAVEMENT WHEN MAINLINE DESIGN IS FLEXIBLE, SAME THICKNESS AS MAINLINE WHEN RIGID DESIGN). WHEN THIS DIMENSION IS LESS THAN 6'-0" USE ISLAND CURB AND GUTTER AND SAME PAVEMENT AS SHOWN ON MAINLINE DESIGN, (SEE DETAIL A).



DETAIL A

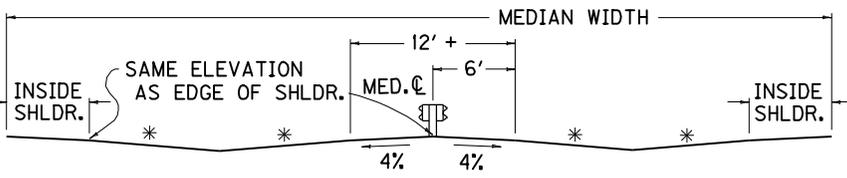
KENTUCKY DEPARTMENT OF HIGHWAYS	
GUARDRAIL AND BRIDGE END DRAINAGE FOR SINGLE STRUCTURES	
STANDARD DRAWING NO. RBB-001-07	
SUBMITTED	12-2-02 DATE
APPROVED	12-2-02 DATE



NOTES

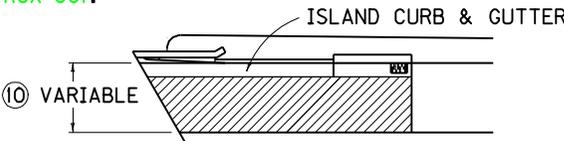
- ① NO ANGLES PERMITTED IN NORMAL GUARDRAIL ALIGNMENT.
- ③ TO TERMINATE GUARDRAIL INSTALLATION:
 - A. ALL FILLS; ALSO SOLID ROCK CUTS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL, USE END TREATMENT TYPE 1.
 - B. SOLID ROCK CUTS WITHOUT ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL, USE END TREATMENT TYPE 2A.
 - C. EARTH CUTS AND SOFT ROCK CUTS, USE END TREATMENT TYPE 3.
 - D. ALL FILLS; ALSO SOLID ROCK CUTS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL, USE END TREATMENT TYPE 4A.
- ⑧ USE ROADWAY OR BORROW EXCAVATION, OR EMBANKMENT IN PLACE.
- ⑩ WHEN THIS DIMENSION IS 6' OR GREATER USE CONCRETE PAVEMENT (8" JOINTED PLAIN CONCRETE PAVEMENT WHEN MAINLINE DESIGN IS FLEXIBLE, SAME THICKNESS AS MAINLINE WHEN RIGID DESIGN). WHEN THIS DIMENSION IS LESS THAN 6' USE ISLAND CURB AND GUTTER AND SAME PAVEMENT AS SHOWN ON MAINLINE DESIGN, (SEE DETAIL A).
- ⑬ FLATTEN SLOPES AND ELIMINATE INLET WHEN MEDIAN SLOPES AWAY FROM BRIDGE.
- ⑭ LOCATE AS CLOSE TO GUARDRAIL AS SLOPE WILL PERMIT.
- ⑮ VARIABLE LENGTH. SEE APPLICABLE "BRIDGE END CONNECTOR" DRAWING (RBC SERIES).
- ⑯ SEE STD. DWG. **RBB-003**, CURRENT EDITION, FOR MEDIAN GUARDRAIL POST ALIGNMENT.
- ⑰ SHOWN FOR FILL CONDITION. REDUCE LENGTH SHOULD USE WITH CURRENT STD. DWG. **RBB-003** FIELD CONDITIONS WARRANT.
- ⑱ ROUND SLOPES IN ACCORDANCE WITH CURRENT STD. DWG. **RGX-001**.

ITEM	STD. DWG. NO. (CURRENT EDITION)
① STEEL W BEAM GUARDRAIL (SINGLE FACE)	RBR-SERIES
② 137'-6" STEEL W BEAM GUARDRAIL (DOUBLE FACE)	
③ END TREATMENT TYPE 1, 2A, 3 OR 4A	
④ END TREATMENT TYPE 2A	RBE-SERIES
⑤ CRASH CUSHION TYPE IX-A	
⑥ BRIDGE END CONNECTORS	RBC-SERIES
⑦ 6' EARTH DIKE	RGX-SERIES
⑧ GUARDRAIL EARTH BERM	RBR-SERIES
⑨ TERMINAL SECTION NO. 1	
DRAINAGE ITEMS (WHEN REQUIRED)	
⑩ BRIDGE END DRAINAGE AREA (TYPICAL)	RDB-SERIES
⑪ CURB BOX INLET TYPE B	
⑫ ISL. INTERGAL CURB OR ISL. CURB AND GUTTER	
⑬ DROP BOX INLET (SEE PLANS FOR TYPE)	
⑭ DROP BOX INLET (SEE PLANS FOR TYPE)	RDB-SERIES



SECTION A-A

* SLOPES 12:1 DESIRABLE, 6:1 MINIMUM
 ⊗ SLOPES 12:1 OR FLATTER REQUIRED



DETAIL A

**KENTUCKY
 DEPARTMENT OF HIGHWAYS**

**GUARDRAIL AND
 BRIDGE END DRAINAGE
 FOR TWIN STRUCTURES**

STANDARD DRAWING NO. RBB-002-08

SUBMITTED: *Alan W. Shipes* 12-2-02
DIRECTOR DIVISION OF DESIGN DATE

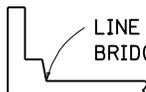
APPROVED: *J. M. [Signature]* 12-2-02
STATE HIGHWAY ENGINEER DATE

CALCULATIONS FOR MEDIAN GUARDRAIL LOCATION (DEPRESSED MEDIANS)

POST NUMBER	36'		40'		50'		60'		64'		84'	
	DISTANCE	OFFSET										
P ₁	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
P ₉	25.0	0.1	25.0	0.1	25.0	0.2	25.0	0.2	25.0	0.3	25.0	0.4
P ₁₃	50.0	0.5	50.0	0.6	50.0	0.8	50.0	1.0	50.0	1.1	50.0	1.5
P ₁₇	75.0	1.1	75.0	1.3	75.0	1.8	75.0	2.2	75.0	2.4	74.9	3.3
P ₂₁	100.0	2.0	100.0	2.3	99.9	3.1	99.9	3.9	99.9	4.3	99.8	5.9
P ₂₅	124.9	3.2	124.9	3.7	124.9	4.9	124.8	6.2	124.8	6.7	124.6	9.2
P ₂₉	149.9	4.6	149.9	5.3	149.8	7.1	149.7	8.9	149.6	9.6	149.2	13.2
P ₃₃	174.9	6.2	174.8	7.2	174.6	9.6	174.4	12.1	174.4	13.0	173.8	17.9
P ₃₇	199.8	8.1	199.7	9.4	199.5	12.6	199.2	15.8	199.0	17.0	198.2	23.4
P ₄₁	224.7	10.3	224.6	11.9	224.3	15.9	223.8	19.9	223.6	21.5	222.4	29.5

DISTANCE IN ABOVE CHART REFERS TO POINTS ALONG EXTENDED LINE AT VARIOUS DISTANCES IN FEET FROM A POINT ON FACE OF GUARDRAIL AT LOCATION OF CENTERLINE OF POST NUMBER P₁.
 OFFSET REFERS TO DISTANCE IN FEET AT 90 DEGREES FROM POINTS ALONG EXTENDED LINE TO FACE OF GUARDRAIL AT CORRESPONDING LISTED POST NUMBER.

USE WITH CURRENT STD. DWG. RBB-002



LINE EXTENDED FROM THIS POINT ON GUTTERLINE OF BRIDGE PARALLELING EDGE OF PAVEMENT.

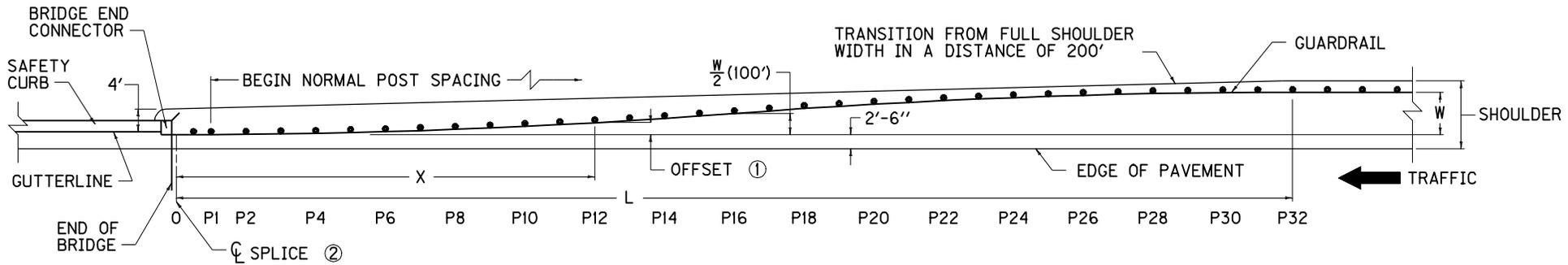
KENTUCKY
DEPARTMENT OF HIGHWAYS

LAYOUT OF GUARDRAIL AT
 TWIN STRUCTURES
 (DEPRESSED MEDIAN)

STANDARD DRAWING NO. RBB-003-02

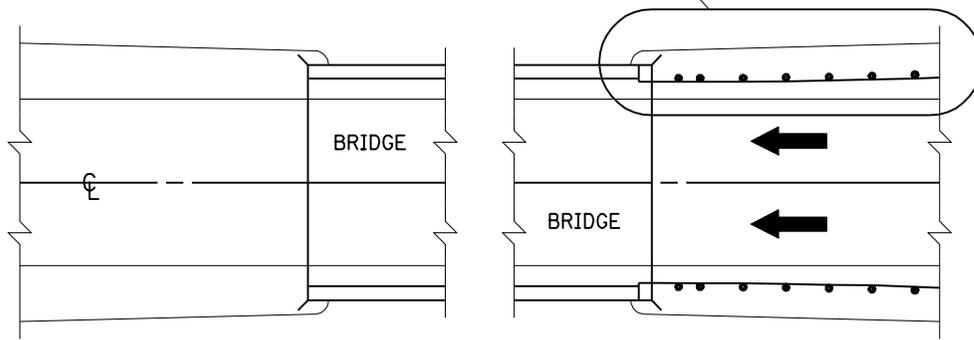
SUBMITTED *John B. Anhalt* 12-1-99
DIRECTOR DIVISION OF DESIGN DATE

APPROVED *J. M. Howell* 12-1-99
STATE HIGHWAY ENGINEER DATE



~ DETAIL A ~

SEE DETAIL A



~ PLAN VIEW ~

~ NOTES ~

- ① OFFSETS SHOWN ARE CALCULATED FROM FACE OF GUARDRAIL (TANGENT EXTENDED FROM BRIDGE). OFFSET DIMENSIONS SHOWN ARE FOR 12 FOOT SHOULDERS, WITH W EQUAL TO 7.5 FEET.
- ② DISTANCES ARE FROM CENTER LINE OF SPLICE, SEE CURRENT STANDARD DRAWING [RBC-002](#) FOR DETAILS.
3. CALCULATIONS FROM 0 FEET TO 100 FEET ARE BASED ON THE FOLLOWING FORMULA: $OFFSET = \left(\frac{x}{L/2}\right)^2 \times \frac{W}{2}$ FROM 100 FEET TO 200 FEET THE PROCEDURE IS AS FOLLOWS, FOR EXAMPLE AT P28: 7.5 FEET MINUS 0.23 FEET = 7.27 FEET, ETC.
4. THE ENGINEER SHALL USE THE OFFSET FORMULA AND CALCULATE OFFSETS NEEDED FOR FIELD CONDITIONS DIFFERENT THAN THAT SHOWN IN THE CHART.

GUARDRAIL FLARE DIMENSIONS

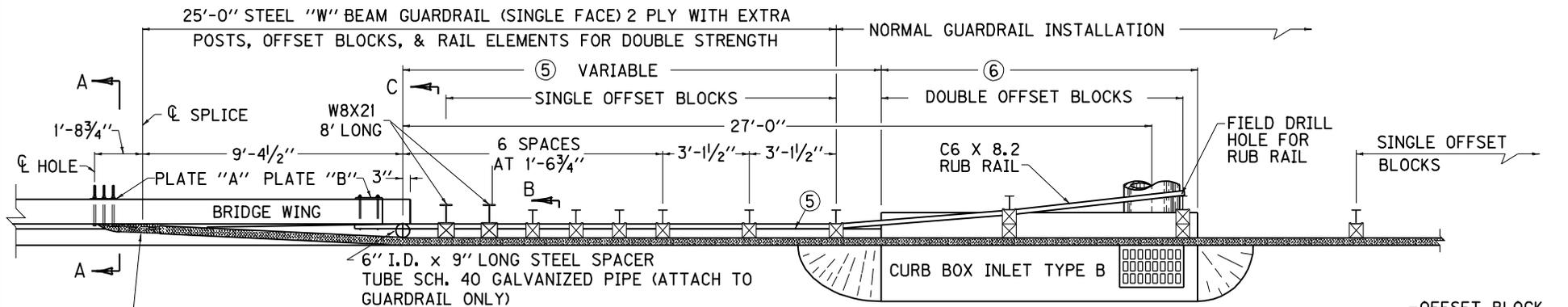
POST NUMBER	DISTANCE	OFFSET
	FEET	
0	0	0
P2	12.5	0.06
P4	25.0	0.23
P6	37.5	0.53
P8	50.0	0.94
P10	62.5	1.46
P12	75.0	2.11
P14	87.5	2.87
P16	100.0	3.75
P18	112.5	4.63
P20	125.0	5.39
P22	137.5	6.04
P24	150.0	6.56
P26	162.5	6.97
P28	175.0	7.27
P30	187.5	7.44
P32	200.0	7.50

KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL TRANSITION
FROM NORMAL SHOULDER
TO NARROW BRIDGE

STANDARD DRAWING NO. RBB-010-04

SUBMITTED: *Alan W. Shouse* 12-2-02
DIRECTOR DIVISION OF DESIGN DATE
APPROVED: *J. M. Howell* 12-2-02
STATE HIGHWAY ENGINEER DATE

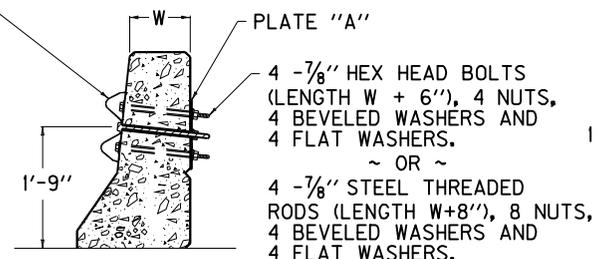


TERMINAL SECT. NO. 2; FOR RECTANGULAR PLATE WASHER REQUIREMENTS AT SPLICE SEE CUR. STD. DWG. **RBR-010**

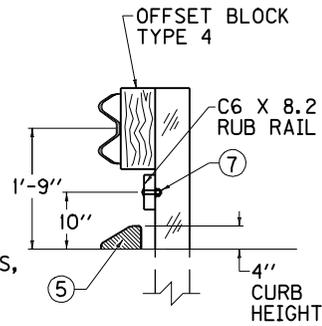
~ NOTES ~ C ← B ←

PLAN VIEW

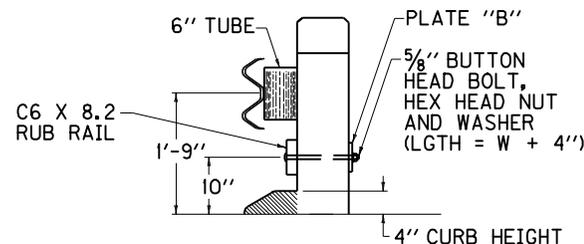
TERMINAL SECT. NO. 2



SECTION A-A



SECTION B-B



SECTION C-C

1. GENERAL
 - a. SEE CUR. STD. DWGS. IN THE **RBB**, **RBI**, **RBR**, AND **RPM-SERIES** FOR OTHER RELATED GUARDRAIL DETAILS AND BRIDGE PLANS FOR BRIDGE WING DETAIL.
 - b. SEE CUR. STD. DWG. **RDB-SERIES** FOR CURB BOX INLET TYPE B.
 - c. GUARDRAIL CONNECTOR TO BRIDGE END TYPE A IS REQUIRED ON BOTH BRIDGE ENDS OF AN UNDIVIDED HIGHWAY AND ONLY ON THE APPROACH BRIDGE ENDS OF A DIVIDED HIGHWAY. GUARDRAIL CONNECTOR TO BRIDGE END TYPE A-1 IS REQUIRED ON THE EXIT END OF A DIVIDED HIGHWAY.
2. MATERIAL REQUIREMENTS

ALL HARDWARE SHALL BE GALVANIZED. (AASHTO M-232)

5/8" STEEL PLATE "A" (AASHTO M-270)

7/8" HEX HEAD BOLTS OR STEEL THREADED RODS (LENGTH AS SHOWN)

7/8" HEAVY HEX NUTS (7/8" THICK) (AASHTO M-291)

7/8" FLAT WASHERS (3/16" THICK) (AASHTO M-293)

7/8" BEVELED WASHERS (5/16" MEAN THICKNESS) (AASHTO M-293)

BOTH THE BOLT AND THREADED ROD SHALL HAVE A MINIMUM OF 50,000 LBS. TENSILE STRENGTH AT THEIR NARROWEST POINT.
3. CONSTRUCTION METHODS
 - a. BACK-UP PLATES ARE NOT REQUIRED WITHIN 2 PLY GUARDRAIL SECTION.
 - b. ELIMINATE EXTRA OFFSET BLOCKS WHEN CURB BOX INLET TYPE B IS NOT REQUIRED.
 - c. HOLES TO BE FORMED THROUGH BRIDGE WING WITH 1" I.D. PLASTIC PIPE FOR 7/8" BOLTS AND 3/4" I.D. PLASTIC PIPE FOR 5/8" BOLTS, PIPE SHALL REMAIN IN PLACE.
 - d. ELIMINATE EXTRA POSTS, OFFSET BLOCKS, RUB RAIL, ONE PLY OF RAIL ELEMENTS AND OTHER INCIDENTALS WHICH ARE IN ADDITION TO NORMAL INSTALLATION OF STEEL BEAM GUARDRAIL USED IN CONSTRUCTION OF DOUBLE STRENGTH RAIL WHEN GUARDRAIL CONNECTOR TO BRIDGE END TYPE A-1 IS REQUIRED.
4. METHOD OF MEASUREMENT AND BASIS OF PAYMENT
 - a. GUARDRAIL CONNECTOR TO BRIDGE END TYPE A SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND INCLUDES: TERMINAL SECTION NO. 2; ALL ITEMS WHICH ARE IN ADDITION TO THE NORMAL INSTALLATION OF STEEL BEAM GUARDRAIL (EXTRA POSTS, OFFSET BLOCKS, RAIL ELEMENTS, HARDWARE, RUB RAIL, ETC.), AND OTHER INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION AS DETAILED.
 - b. GUARDRAIL CONNECTOR TO BRIDGE END TYPE A-1 SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH, WHICH INCLUDES TERMINAL SECT. NO. 2 AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION.
 - c. STEEL "W" BEAM GUARDRAIL (SINGLE FACE) AND ISLAND CURB ARE SEPARATE BID ITEMS WHICH ARE ALWAYS REQUIRED. CURB BOX INLET TYPE B IS A SEPARATE BID ITEM THAT WILL BE USED WHEN REQUIRED FOR BRIDGE END DRAINAGE.
 - d. THE PLASTIC PIPE AND COST OF FORMING SHALL BE INCLUDED IN THE UNIT PRICE BID FOR BRIDGE SUPERSTRUCTURE CONCRETE.

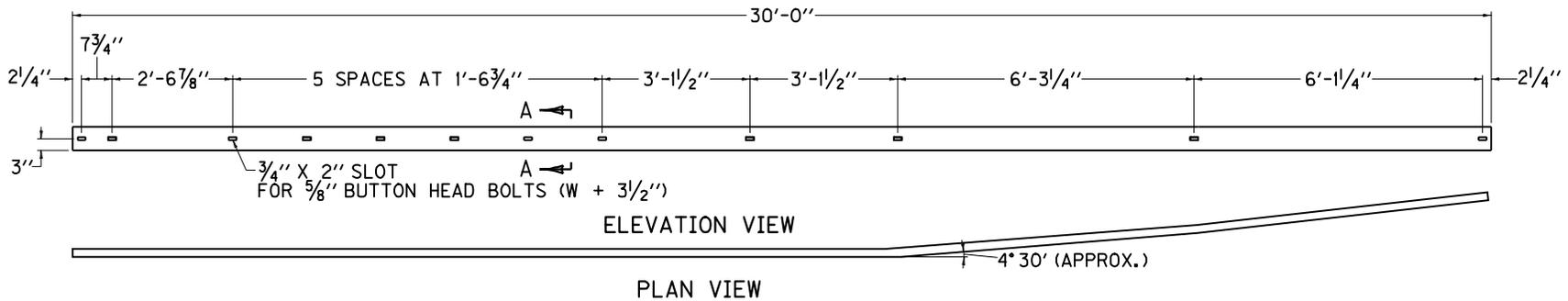
- 5 ISLAND CURB. TRANSITION FROM ISLAND CURB SHAPE TO SHAPE ON BRIDGE WING WITHIN 7'-3". LENGTH OF CURB VARIABLE (22'-3" WHEN L=5'-0") (17'-3" WHEN L=10'-0") (12'-3" WHEN L=15'-0") (7'-3" WHEN L=20'-0"). ON APPROACH END CONSTRUCT 25'-0" OF ISLAND CURB EVEN WHEN CURB BOX INLET TYPE B IS NOT REQUIRED.
- 6 6'-4" WHEN L=5'-0"
11'-4" WHEN L=10'-0" ★
16'-4" WHEN L=15'-0"
21'-4" WHEN L=20'-0"
- 7 5/8" x 3 1/2" BUTTON HEAD BOLT, HEX HEAD NUT.
- 8 CURB NOT REQUIRED ON TRAILING END UNLESS NEEDED FOR DRAINAGE.
- ★ 10'-0" LENGTH IS USED MOST FREQUENTLY. L EQUALS THROAT LENGTH OF BOX.

SHEET 1 OF 3
KENTUCKY
DEPARTMENT OF HIGHWAYS

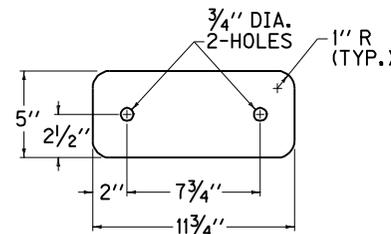
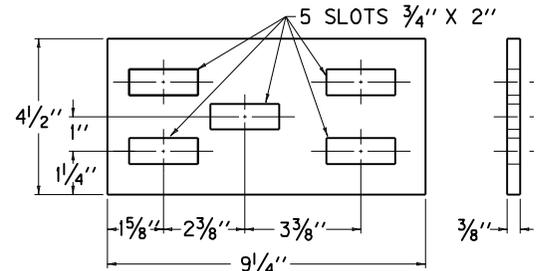
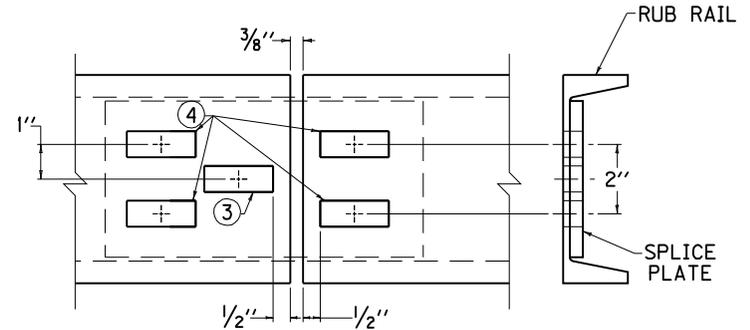
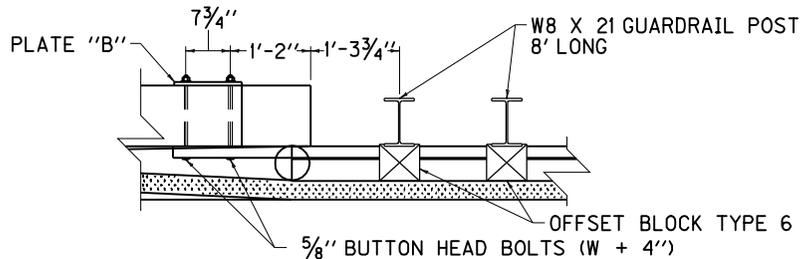
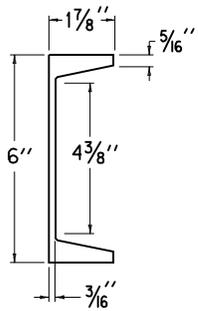
GUARDRAIL CONNECTOR
TO BRIDGE END
TYPE A AND A-1

STANDARD DRAWING NO. RBC-001-09

SUBMITTED <i>David Kutt</i>	11-21-07
DIRECTOR DIVISION OF DESIGN	DATE
APPROVED <i>Matthew A. Anderson</i>	11-21-07
STATE HIGHWAY ENGINEER	DATE



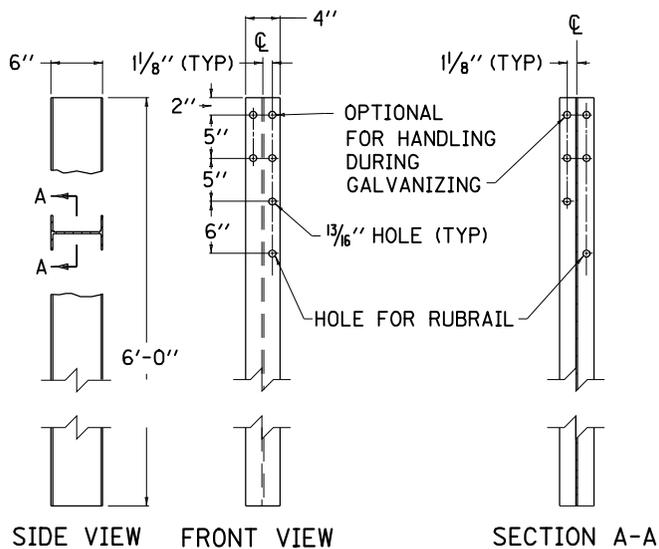
C6 X 8.2 RUB RAIL



- ~ NOTES ~
- RUB RAIL IS DETAILED AS ONE CONTINUOUS PIECE, A SPLICE IS PERMITTED PROVIDING IT IS DONE AT A GUARDRAIL POST. SEE "RUB RAIL SPLICE" DETAIL.
 - MATERIAL REQUIREMENTS
 ALL HARDWARE SHALL BE GALVANIZED. (AASHTO M-232)
 5/8" STEEL PLATE "B" (AASHTO M-270)
 3/8" STEEL PLATE "RUB RAIL SPLICE PLATE" (AASHTO M-270)
 5/8" BUTTON HEAD BOLTS (AASHTO M-180)
 5/8" HEAVY HEX NUTS (5/8" THICK) (AASHTO M-291)
 5/8" FLAT WASHERS (1/8" THICK) (AASHTO M-293)
 C6 X 8.2 RUB RAIL (AASHTO M160 AND M270)
 GRADE 36, GALVANIZED ACCORDING TO AASHTO M111 AFTER PUNCHING AND CUTTING ARE COMPLETE.
 - THIS SLOT FOR BOLTING RAIL AND SPLICE PLATE TO GUARDRAIL POST WITH A 5/8" X 3 1/2" BUTTON HEAD BOLT AND HEX HEAD NUT.
 - THESE SLOTS FOR BOLTING RAIL TO SPLICE PLATE WITH A 5/8" X 1 1/2" BUTTON HEAD BOLT AND HEX HEAD NUT.

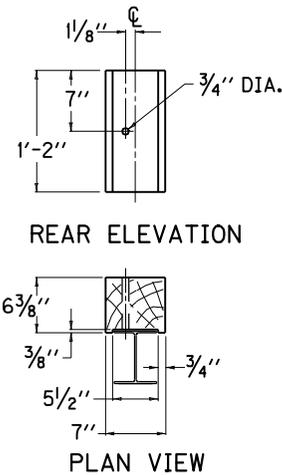
SHEET 2 OF 3
 KENTUCKY
 DEPARTMENT OF HIGHWAYS
 GUARDRAIL CONNECTOR
 TO BRIDGE END
 TYPE A AND A-1
 COMPONENTS
 STANDARD DRAWING NO. RBC-002-01

APPROVED: *David Kutt* DIRECTOR DIVISION OF DESIGN 11-21-07
 STATE HIGHWAY ENGINEER DATE



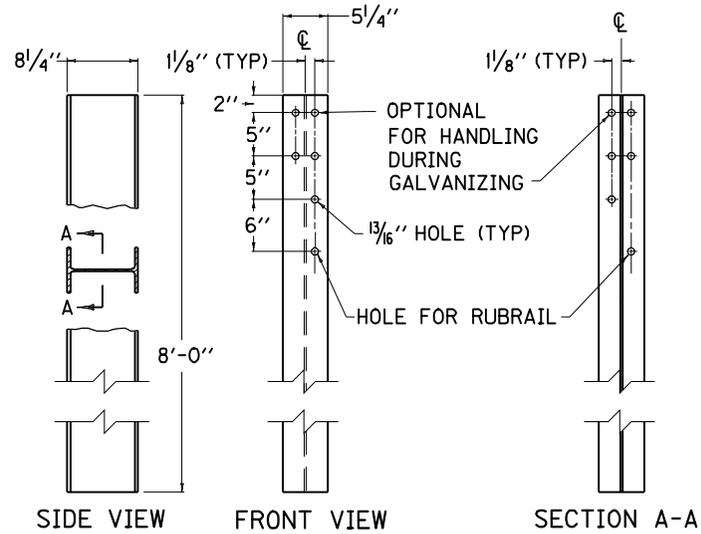
SIDE VIEW FRONT VIEW SECTION A-A

~ W6 X 9.0 STEEL GUARDRAIL POST ~
(USED WITH C6 X 8.2 RUB RAIL)



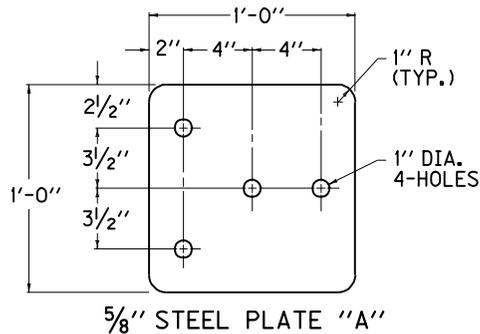
REAR ELEVATION
PLAN VIEW
OFFSET BLOCK TYPE 6
(TIMBER)

(FOR USE WITH W8 X 21 STEEL POST ONLY)

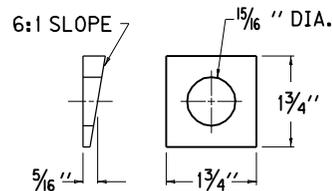


SIDE VIEW FRONT VIEW SECTION A-A

~ W8 X 21 STEEL GUARDRAIL POST ~



5/8" STEEL PLATE "A"

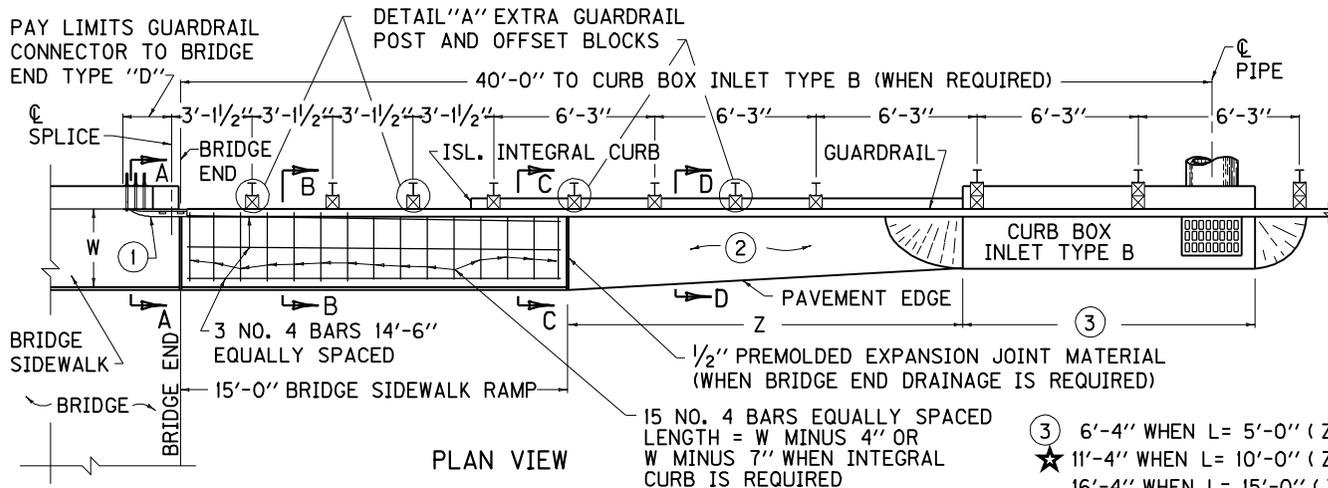


BEVELED WASHER

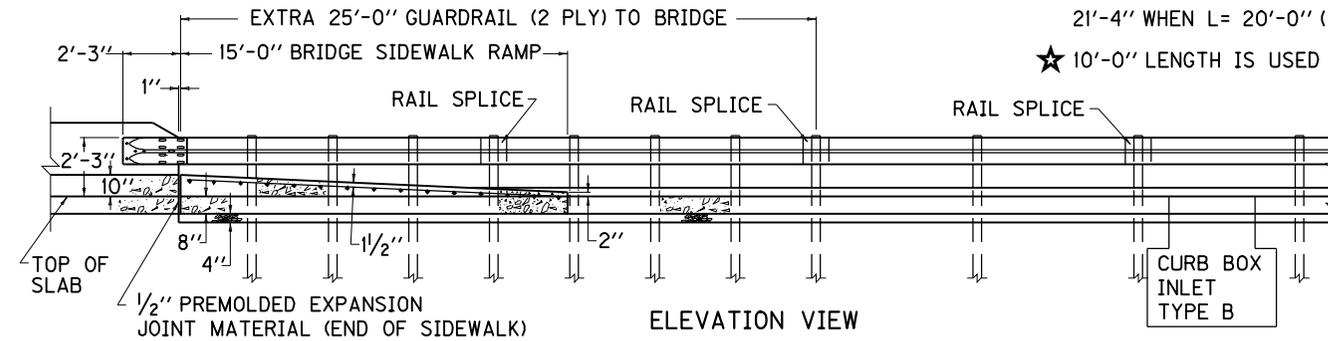
SHEET 3 OF 3
KENTUCKY
DEPARTMENT OF HIGHWAYS
GUARDRAIL CONNECTOR
TO BRIDGE END
TYPE A AND A-1
COMPONENTS

STANDARD DRAWING NO. RBC-003-07

SUBMITTED <i>David Kutt</i>	11-21-07 DATE
APPROVED <i>Matthew W. [Signature]</i>	11-21-07 DATE
<small>DIRECTOR DIVISION OF DESIGN</small>	<small>STATE HIGHWAY ENGINEER</small>



PLAN VIEW



ELEVATION VIEW

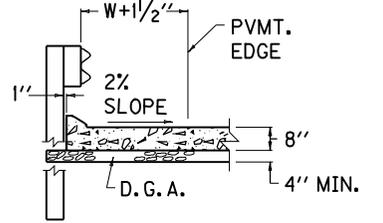
NOTES:
 GUARDRAIL CONNECTOR TO BRIDGE END TYPE "D" SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND SHALL INCLUDE TERMINAL SECTION NO. 2, EXTRA GUARDRAIL POST AND OFFSET BLOCKS, EXTRA GUARDRAIL, BRIDGE SIDEWALK RAMP (INCLUDING CLASS "A" CONCRETE, STEEL REINF. AND STRUCTURE EXCAVATION) ALL COMPLETELY INSTALLED.
 ISLAND INTEGRAL CURB (LIN. FT.) - DENSE GRADED AGGREGATE BASE (TON) - CLASS "A" CONCRETE (CU. YD.) FOR GUTTER PAVING (2) IN PLACE - AND CURB BOX INLET TYPE B (EACH) - ARE ADDITIONAL BID ITEMS WHEN APPLICABLE AND NEEDED FOR BRIDGE END DRAINAGE.
 THIS DRAWING DEPICTS GUARDRAIL CONNECTED TO A POST AT THE END OF THE BRIDGE. WHEN A BRIDGE WING EXTENDS BEYOND THE END OF THE BRIDGE, THE GUARDRAIL SHALL BE MOVED BACK AND CONNECTED IN A CORRESPONDING MANNER.
 THE GUARDRAIL CONNECTOR TO BRIDGE END TYPE "D" SHALL BE APPLIED ON EACH END OF THE BRIDGE, WHERE A SIDEWALK EITHER EXISTS OR IS PROPOSED, ON THE STRUCTURE AND NOT ON THE ROADWAY. THIS IS ONLY APPLICABLE TO RURAL STRUCTURES THAT HAVE TWO DIRECTIONAL TRAFFIC WITH SIDEWALK.
 SEE STANDARD DRAWING NO. RBR-SERIES (CURRENT EDITION) FOR ALL OTHER APPLICABLE MATERIAL AND CONSTRUCTION REQUIREMENTS.
 TWO (2) EXTRA GUARDRAIL SECTIONS, TWO (2) PLY, SHALL BE CONSTRUCTED FOR THE 25' FOR DOUBLE STRENGTH. (SEE DETAIL "A").
 BACK UP PLATES SHALL NOT BE REQUIRED WITHIN 2 PLY GUARDRAIL SECTION.

(2) APPROX. QUANTITY PER LIN. FT. Z DIMENSION.

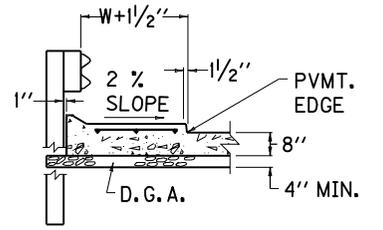
(4) CONNECT GUARDRAIL TO BRIDGE END WITH :
 4-7/8" (LTH. = "Z" PLUS 3") HEX HEAD BOLTS OR 4-7/8" (LENGTH = "Z" PLUS 4") STEEL THREADED RODS WITH 4 NUTS FOR THE BOLTS AND 8 NUTS FOR THE RODS AND WITH 8 FLAT WASHERS FOR EITHER.
 FORM 1" HOLES FOR THE 7/8" BOLTS WITH PLASTIC PIPE IN PROPOSED BRIDGE ENDS.
 DRILL 1" HOLES FOR THE 7/8" BOLTS THROUGH EXISTING BRIDGE ENDS.
 BOTH THE 7/8" BOLTS AND STEEL THREADED RODS SHALL HAVE A MINIMUM OF 50,000 LBS. TENSILE STRENGTH AT THEIR NARROWEST POINT.
 ALL HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.

APPROXIMATE QUANTITIES

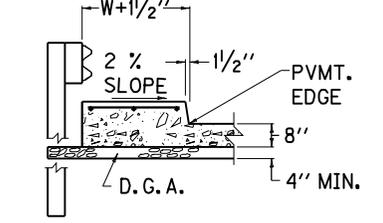
"W"	SIDEWALK RAMP	GUTTER PAVING	STEEL REINFORCEMENT	ISLAND INTEGRAL CURB
	CUBIC YARDS	CLASS "A" CONC.	LBS.	LINEAR FEET
2'-6"	1.9	(2)	51	19'-6"
3'-0"	2.3		56	
3'-6"	2.7		61	
4'-0"	3.1		66	



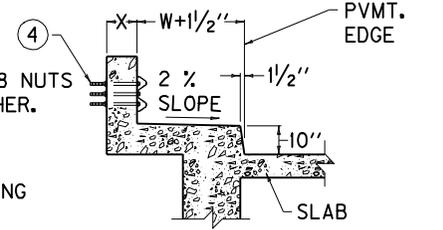
SECTION D-D



SECTION C-C



SECTION B-B



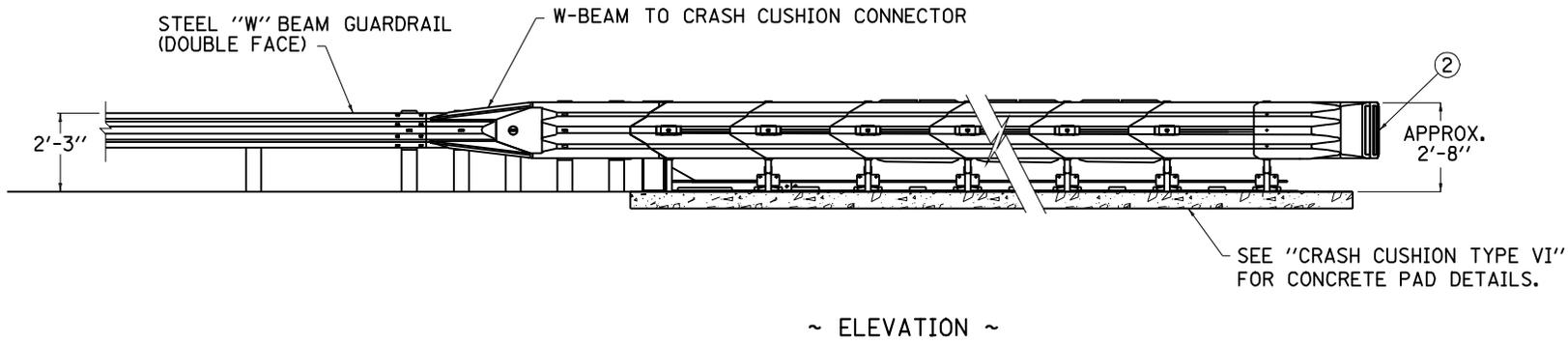
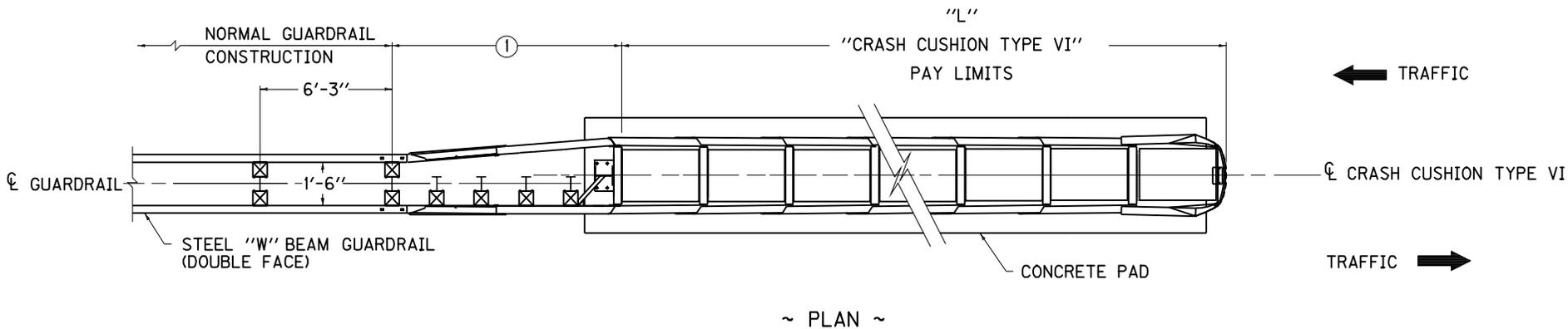
SECTION A-A (THRU BRIDGE)

KENTUCKY DEPARTMENT OF HIGHWAYS

GUARDRAIL CONNECTOR TO BRIDGE END TYPE "D"

STANDARD DRAWING NO. RBC-004-05

SUBMITTED *John B. Anderson* 12-1-99
 DIRECTOR DIVISION OF DESIGN DATE
 APPROVED *[Signature]* 12-1-99
 STATE HIGHWAY ENGINEER DATE



~ NOTES ~

- ① ALL HARDWARE, POSTS, OFFSET BLOCKS, ADDITIONAL GUARDRAIL, W-BEAM TO CRASH CUSHION CONNECTOR, LABOR AND INCIDENTALS WITHIN THE TRANSITION LENGTH, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR "CRASH CUSHION TYPE VI ★ Δ ."
- Δ ADD SUFFIX OF 1 TO BID ITEM WHICH DENOTES A BACK-UP SYSTEM OTHER THAN CONCRETE, AS DETAILED ON PLANS AND APPROVED SHOP DRAWING.
- ② OBJECT MARKER TYPE 1, (SEE CURRENT MUTCD MANUAL FOR DETAILS) CENTER HORIZ. AND VERT.

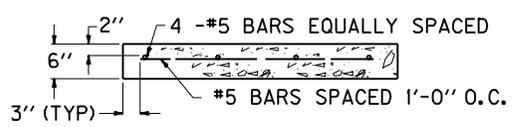
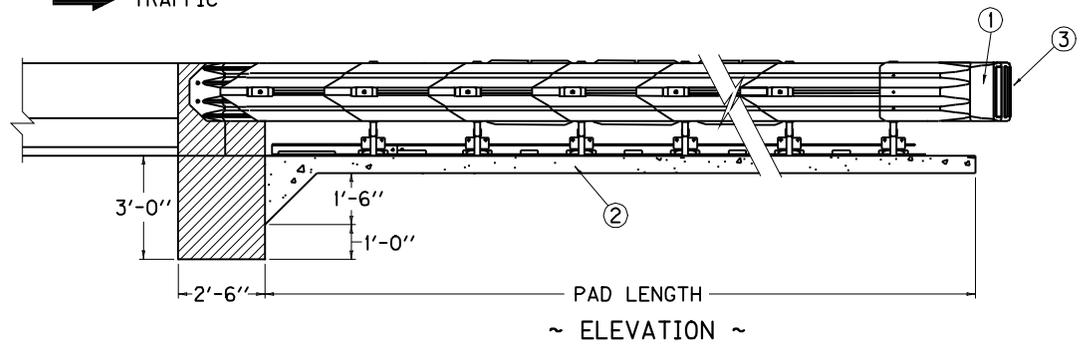
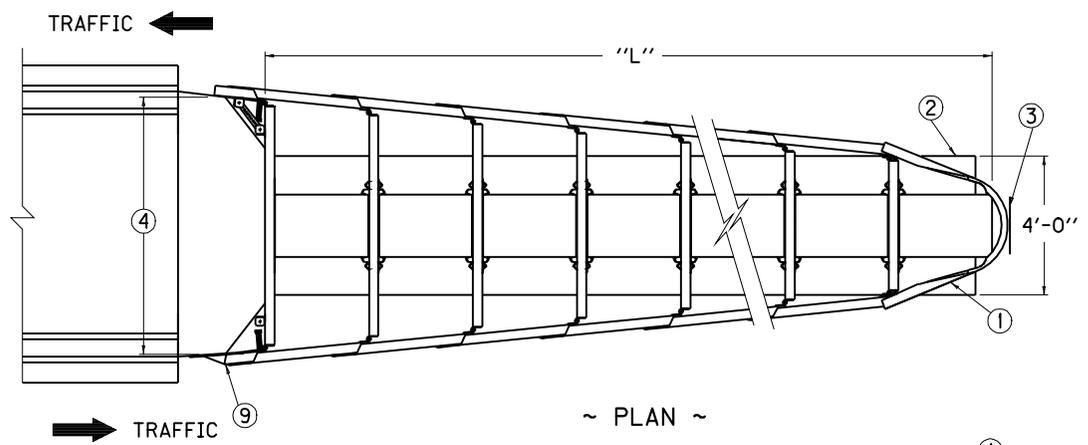
USE WITH CURRENT STD. DWG. RBE-060 .

KENTUCKY
DEPARTMENT OF HIGHWAYS
CONNECTION DETAILS OF
CRASH CUSHION TYPE VI
TO DOUBLE FACE
GUARDRAIL

STANDARD DRAWING NO. RBC-110-09

SUBMITTED	<i>David Kutt</i>	11-21-07
DIRECTOR DIVISION OF DESIGN		DATE
APPROVED	<i>Matthew W. [Signature]</i>	11-21-07
STATE HIGHWAY ENGINEER		DATE

~ NOTES ~



~ LEGEND ~

- ① NOSE ASSEMBLY
- ② 6" CONCRETE PAD
- ③ OBJECT MARKER TYPE 1, (SEE CUR. MUTCD MANUAL FOR DETAILS) CENTER HORIZ. AND VERT.
- ④ MEDIUM WIDTH = 70 1/2", APPROX. 2.8 CU. YD. CONC. AND 265 LBS. OF STEEL FOR MED. BACKUP. WIDE WIDTH = 91 1/2", APPROX. 3.8 CU. YD. CONC. AND 299 LBS. OF STEEL FOR WIDE BACKUP.

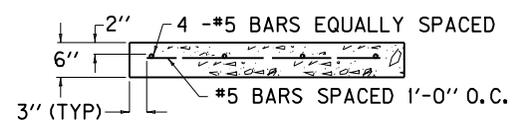
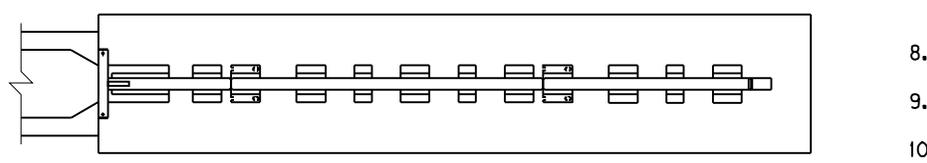
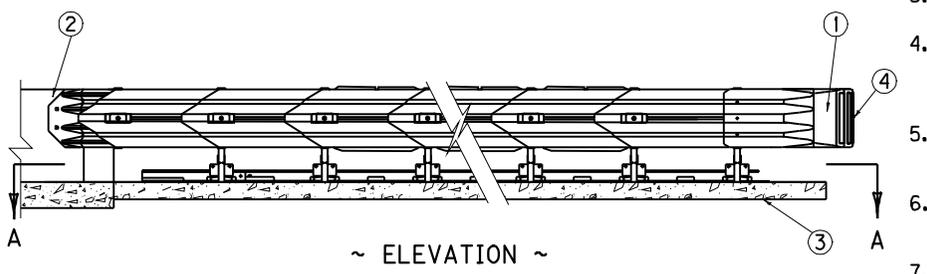
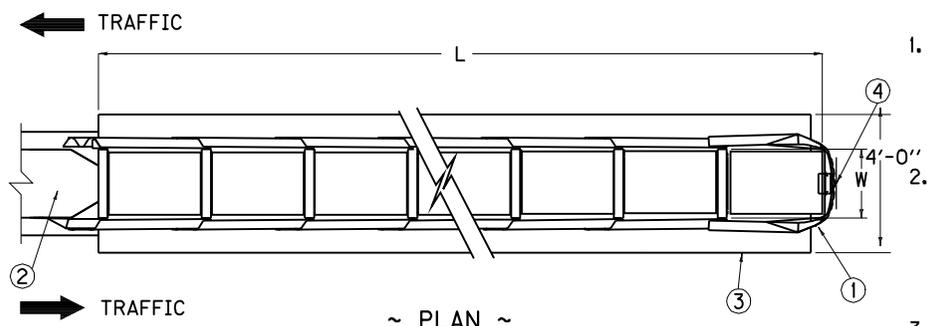
1. THE CONTRACT UNIT PRICE SHALL BE CRASH CUSHION TYPE VII, CLASS **●**, **⬡**, **▲**.
 - CLASS B OR C, AS REQUIRED
 - ⬡ TEST LEVEL 2 (TL2) OR TEST LEVEL 3 (TL3), AS REQUIRED.
 - ▲ EITHER M MEDIUM, OR W WIDE, OR S SPECIAL WIDE UNITS
2. THE CONC. PAD SHALL BE REQUIRED ONLY WHEN THE UNIT IS CONSTRUCTED ON NON-RIGID PAVEMENT AND SHALL BE MEASURED AND PAID FOR PER CUBIC YARD OF CLASS "AA" CONC., WHICH SHALL INCLUDE ALL NECESSARY EXCAVATION AND REINFORCING STEEL. THE PAD SHALL BE CURED AND FINISHED AS EITHER SIDEWALK OR PAVEMENT. REAR FOOTINGS AND REAR BACK-UP WALL, EXCEPT ON STRUCTURES, SHALL BE REQUIRED AT ALL INSTALLATIONS, WHICH SHALL BE MEASURED AND PAID FOR AS CLASS "AA" CONCRETE AND SHALL INCLUDE ALL NECESSARY EXCAVATION AND REINFORCING STEEL.
3. THE CROSS SLOPE ON THE PAD OR PAVEMENT SHALL NOT EXCEED 5 PERCENT.
4. WHEN INSTALLED ON A STRUCTURE, DETAILS FOR ANCHORAGE SHALL BE DEVELOPED AND SHOWN ELSEWHERE ON THE PLANS.
5. SPECIAL WIDTH UNITS ARE AVAILABLE FROM THE MANUFACTURERS. WHEN SPECIAL WIDE UNITS ARE REQUIRED DETAILS OF THE UNIT SHALL BE DEVELOPED AND SHOWN ELSEWHERE ON THE PLANS.
6. SEE SHOP DRAWINGS FROM MANUFACTURER FOR BACK UP DETAILS.
7. CONCRETE PAD AND BELOW GRADE ANCHOR SHALL BE PLACED MONOLITHICALLY.
8. CRASH CUSHION TYPE VII IS A PATENTED (ONE SOURCE) PRODUCT MANUFACTURED BY ENERGY ABSORPTION SYSTEMS, INC. OF CHICAGO, IL., TRINITY INDUSTRIES, INC. OF DALLAS, TX. OR SCI PRODUCTS, INC. OF ST. CHARLES, IL.
- ⑨ END SHOE MAY BE ELIMINATED WITH ONE WAY TRAFFIC.
10. THE CRASH CUSHION TYPE VII MAY ALSO BE UTILIZED FOR TEMPORARY USE AND CONSTRUCTION ZONES (CLASS BT OR CLASS CT).
11. A CRASH CUSHION TYPE VII CLASS B IS TO BE USED IN AREAS WHERE CRASH HISTORY IS NOT KNOWN TO BE SEVERE.
12. A CRASH CUSHION TYPE VII CLASS C IS CONSIDERED A SEVERE USE CRASH CUSHION.
13. WHEN SELECTING BETWEEN THE CRASH CUSHION CLASS B OR C, CONSIDER THE FOLLOWING FACTORS:
 - WHETHER THE HAZARD TO BE SHIELDED IS LOCATED IN A HIGH OR LOW RISK IMPACT AREA;
 - INITIAL, MAINTENANCE, AND RESTORATION COST; AND
 - EASE OR DIFFICULTY OF RESTORATION OF THE SYSTEM AFTER IMPACT. THE IMPORTANCE OF THIS FACTOR WILL BE RELATED TO THE TRAFFIC AND HAZARD LEVELS AT A SITE. MORE TRAFFIC AND HIGHER HAZARDS WILL MAKE SPEEDY REPAIR OR REPLACEMENT A HIGHER PRIORITY. A SUGGESTED ADT RANGE IS GIVEN IN THE TABLE BELOW FOR GUIDANCE. THIS GUIDANCE SHOULD NOT SUPERSEDE THE APPLICATION OF SOUND ENGINEERING PRINCIPLES BY EXPERIENCED DESIGN PROFESSIONALS.

CLASS	SPEED (MPH)	ATTENUATOR			APPROX. CU. YD. CONC. FOR PAD	SUGGESTED ADT* RANGE (P.C.P.L.)**
		MODEL	PRODUCT NAME	LENGTH		
B	45 & LESS	TL2	SHORTRACC	14'-0"	1.12	UP TO 12,000
			3-BAY QUADGUARD	12'-0"	0.87	
	OVER 45	TL3	TRACC	21'-0"	1.63	
			6-BAY QUADGUARD	21'-0"	1.53	
C	OVER 45	TL3	SC1100GM	23'-0"	1.7	8,000 AND OVER
			QUADGUARD ELITE	26'-7"	1.98	

* AVERAGE DAILY TRAFFIC
** PASSENGER CARS PER LANE

KENTUCKY
DEPARTMENT OF HIGHWAYS
CRASH CUSHION
TYPE VII
CLASS B AND C
(ONE & TWO DIRECTION)
STANDARD DRAWING NO. RBE-040-09

SUBMITTED: *David Kutt* 11-21-07
 DIRECTOR DIVISION OF DESIGN DATE
 APPROVED: *Matthew W. [Signature]* 11-21-07
 STATE HIGHWAY ENGINEER DATE



- ~ NOTES ~
- CRASH CUSHION TYPE VI, CLASS , , CLASS B OR C, AS REQUIRED
 EITHER TEST LEVEL 2 (TL2) OR TEST LEVEL 3 (TL3), AS REQUIRED.
 SEE "CONNECTION DETAILS OF CRASH CUSHION TYPE VI TO DOUBLE FACE GUARDRAIL".
 - THE CONCRETE PAD, PAD EXCAVATION AND STEEL REINFORCEMENT, INSTALLED IN PLACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CRASH CUSHION TYPE VI. USE CLASS AA CONCRETE TO CONSTRUCT CONCRETE PAD (SEE CONCRETE PAD SECTION FOR STEEL REQUIREMENTS). THE PAD SHALL BE CURED AND FINISHED AS EITHER SIDEWALK OR PAVEMENT. THE CROSS SLOPE OF THE PAD OR PAVEMENT SHALL NOT EXCEED 5%. THE PAD WILL NOT BE REQUIRED WHEN THE UNIT IS CONSTRUCTED ON RIGID PAVEMENT.
 - CRASH CUSHION TYPE VI MAY BE USED AT THE END OF: CONCRETE MEDIAN BARRIER, BRIDGE PIERS AND STEEL "W" BEAM GUARDRAIL (DOUBLE FACE).
 - WHEN CRASH CUSHION TYPE VI CONNECTS TO: CONCRETE MEDIAN BARRIER OR BRIDGE PIER THE CONTRACT UNIT PRICE SHALL INCLUDE: CRASH CUSHION TYPE VI, ALL HARDWARE, ADDITIONAL RAIL ELEMENTS, POST, CONCRETE PAD AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION.
 - THIS DRAWING DEPICTS CONNECTION OF CRASH CUSHION TYPE VI TO CONCRETE MEDIAN BARRIER END. FOR THIS APPLICATION SEE CURRENT STD. DWG. [RBE-065](#) "CONCRETE MEDIAN BARRIER END".
 - WHEN CRASH CUSHION TYPE VI CONNECTS TO DOUBLE FACE GUARDRAIL SEE CURRENT STD. DWG. [RBC-110](#) "CONNECTION DETAILS OF CRASH CUSHION TYPE VI TO DOUBLE FACE GUARDRAIL".
 - PERMISSIBLE ALTERNATES FOR CRASH CUSHION TYPE VI ARE PATENTED ITEMS: QUADGUARD MANUFACTURED BY ENERGY ABSORPTION SYSTEMS, INC. OF CHICAGO, IL., TRINITY INDUSTRIES, INC. OF DALLAS, TX. OR SCI PRODUCTS, INC. OF ST. CHARLES, IL.
 - THE MANUFACTURER SHALL FURNISH TWO (2) SETS OF SHOP PLANS TO THE CONTRACTOR WITH EACH INSTALLATION.
 - THE CRASH CUSHION TYPE VI MAY ALSO BE UTILIZED FOR TEMPORARY USE AND CONSTRUCTION ZONES (CLASS BT OR CLASS CT).
 - A CRASH CUSHION TYPE VI CLASS B IS TO BE USED IN AREAS WHERE CRASH HISTORY IS NOT KNOWN TO BE SEVERE.
 - A CRASH CUSHION TYPE VI CLASS C IS CONSIDERED A SEVERE USE CRASH CUSHION.
 - WHEN SELECTING BETWEEN THE CRASH CUSHION CLASS B OR CLASS C, CONSIDER THE FOLLOWING FACTORS:
 - WHETHER THE HAZARD TO BE SHIELDED IS LOCATED IN A HIGH-OR LOW-RISK IMPACT AREA;
 - INITIAL, MAINTENANCE, AND RESTORATION COST; AND
 - EASE OR DIFFICULTY OF RESTORATION OF THE SYSTEM AFTER IMPACT. THE IMPORTANCE OF THIS FACTOR WILL BE RELATED TO THE TRAFFIC AND HAZARD LEVELS AT A SITE. MORE TRAFFIC AND HIGHER HAZARDS WILL MAKE SPEEDY REPAIR OR REPLACEMENT A HIGHER PRIORITY. A SUGGESTED ADT RANGE IS GIVEN IN THE TABLE BELOW FOR GUIDANCE. THIS GUIDANCE SHOULD NOT SUPERCEDE THE APPLICATION OF SOUND ENGINEERING PRINCIPLES BY EXPERIENCED DESIGN PROFESSIONALS.

CLASS	SPEED (MPH)	ATTENUATOR			APPROX. CU. YD. CONC. FOR PAD	SUGGESTED ADT* RANGE (P.C.P.L.)**
		MODEL	PRODUCT NAME	LENGTH		
B	45 & LESS	TL2	SHORTRACC	14'-0"	1.12	UP TO 12,000
			3-BAY QUADGUARD	12'-0"	0.87	
	OVER 45	TL3	TRACC	21'-0"	1.63	
			6-BAY QUADGUARD	21'-0"	1.53	
C	OVER 45	TL3	SCI100GM	23'-0"	1.7	8,000 AND OVER
			QUADGUARD ELITE	26'-7"	1.98	

W = 2'-0" (INSIDE BAY WIDTH)

* AVERAGE DAILY TRAFFIC
 ** PASSENGER CARS PER LANE

- ~ LEGEND ~
- NOSE ASSEMBLY
 - BACKUP
 - 6" CONCRETE PAD
 - OBJECT MARKER TYPE 1, (SEE CUR. MUTCD MANUAL FOR DETAILS) CENTER HORIZ. AND VERT.

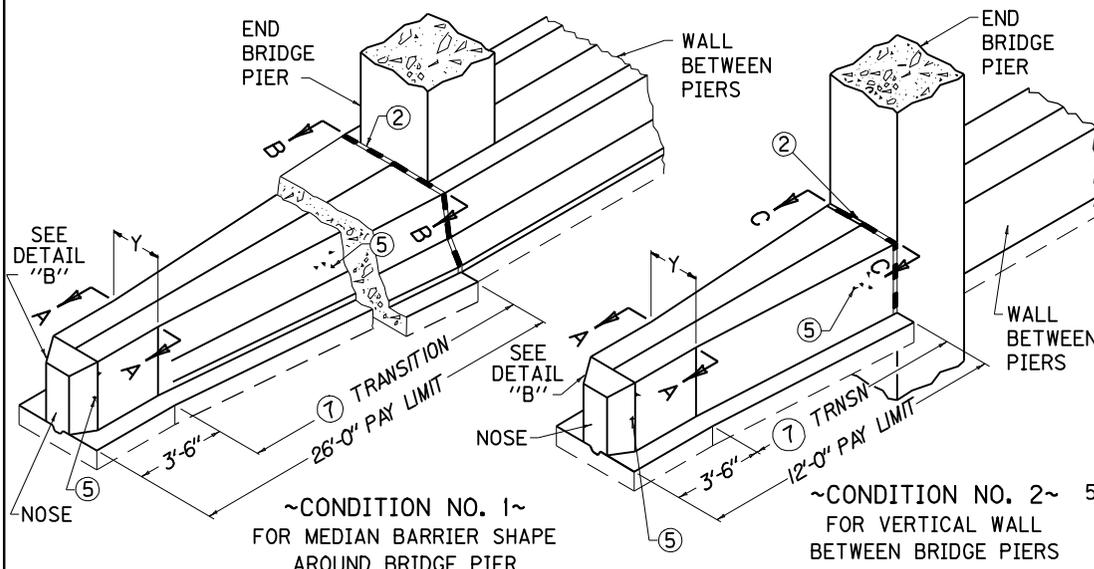
USE WITH CUR. STD. DWGS.
[RBE-065](#) OR [RBC-110](#)
 AS APPLICABLE

KENTUCKY
 DEPARTMENT OF HIGHWAYS

CRASH CUSHION
 TYPE VI
 (ONE & TWO DIRECTION)

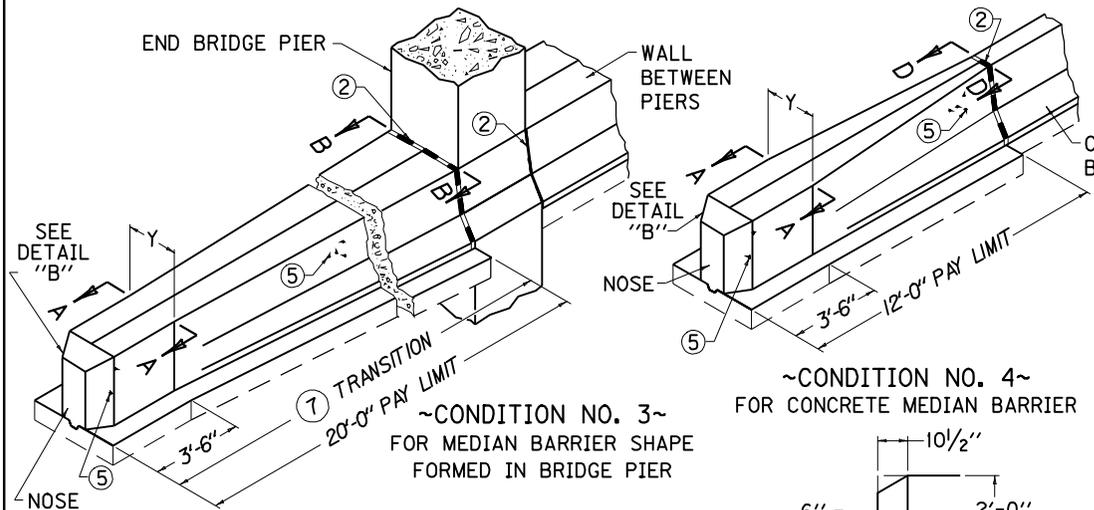
STANDARD DRAWING NO. RBE-060-13

SUBMITTED	<i>David Kutt</i>	11-21-07
	DIRECTOR DIVISION OF DESIGN	DATE
APPROVED	<i>Matthew [Signature]</i>	11-21-07
	STATE HIGHWAY ENGINEER	DATE



~CONDITION NO. 1~
FOR MEDIAN BARRIER SHAPE
AROUND BRIDGE PIER

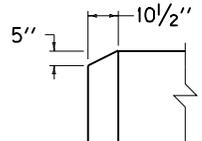
~CONDITION NO. 2~
FOR VERTICAL WALL
BETWEEN BRIDGE PIERS



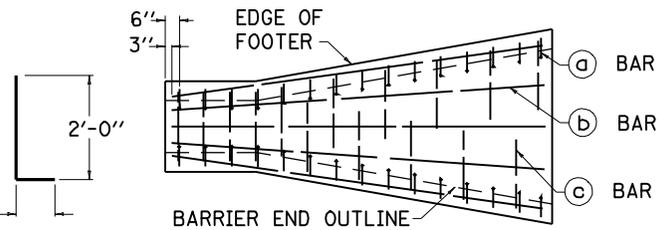
~CONDITION NO. 3~
FOR MEDIAN BARRIER SHAPE
FORMED IN BRIDGE PIER

~CONDITION NO. 4~
FOR CONCRETE MEDIAN BARRIER

- NOTES**
- BID ITEMS AND UNIT TO BID:
 - STEEL REINFORCEMENT-POUNDS (MIN. GRADE 40).
 - CLASS "A" CONC.-CUBIC YARDS (INCLUDES ALL MATERIALS, TOOLS, FORMS, LABOR, EXCAVATION, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN ACCORDANCE WITH THIS DRAWING).
 - 1/2" PREMOLDED EXPANSION JOINT MATERIAL REQUIRED.
 - STEEL REINFORCING BARS SHALL BE EVENLY SPACED AS SHOWN.
 - CONCRETE QUANTITIES FOR CONDITION NOS. 1, 2, AND 3 ARE BASED ON A BRIDGE PIER WIDTH OF 3'-0".
 - USE DETAIL "A" FOR ENERGY ABSORPTION SYSTEM'S QUADGUARD CRASH CUSHION ALTERNATE. ALL OTHER CONNECTIONS REQUIRE A SQUARE NOSE.
 - Y=2'-0" FOR CRASH CUSHION TYPE VI, AND Y=1'-6" FOR GUARDRAIL CONNECTOR TO CONCRETE MEDIAN BARRIER END.
 - WHEN THE CONCRETE MEDIAN BARRIER END IS PLACED AT A PIER WIDER THAN 3'-0" THE BARRIER END TRANSITION SHALL BE CONSTRUCTED ON A 12:1 MIN. TAPER AND ADDITIONAL CONCRETE AND STEEL QUANTITIES SHALL BE CALCULATED.

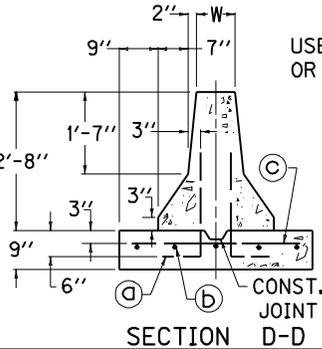
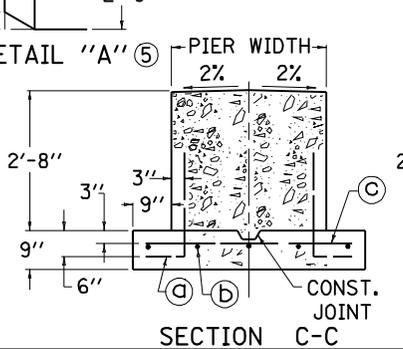
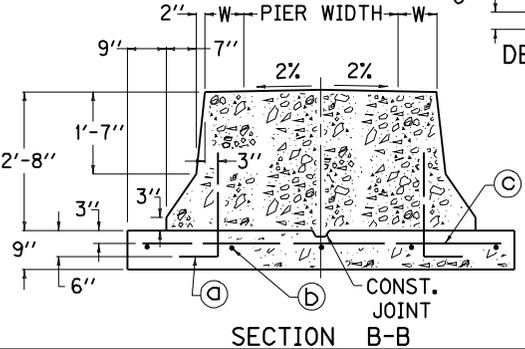
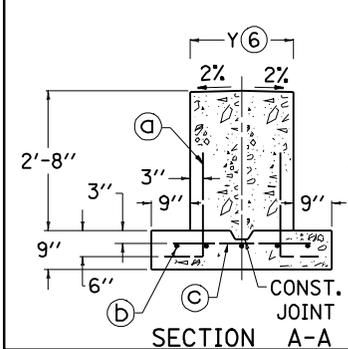


DETAIL "B"



TYPICAL STEEL PLACEMENT

CONDITION NO.	NO. 5 STEEL REINFORCEMENT BARS						CUBIC YARD (4) CLASS "A" CONC.			
	W	QTY. LGTH.	QTY. LGTH.	QTY. LGTH.	LBS.	Y=2'-0"	Y=1'-6"			
1	6"	52		25'-6"	26	354	11.56	10.19		
2	-	24		11'-6"	12	163	4.07	3.58		
3	-	40	2'-9"	5	19'-6"	20	2'-8"	272	7.70	6.96
4	9"	24				163	3.38	2.89		
	12"						3.51	3.03		



USE WITH CUR. STD. DWG. RBE-060 OR RBC-100 AS APPLICABLE.

KENTUCKY
DEPARTMENT OF HIGHWAYS

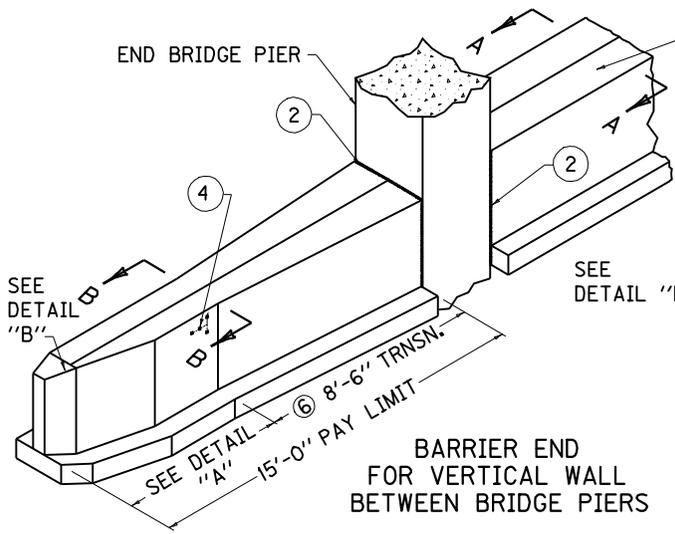
CONCRETE MEDIAN
BARRIER END

STANDARD DRAWING NO. RBE-065-06

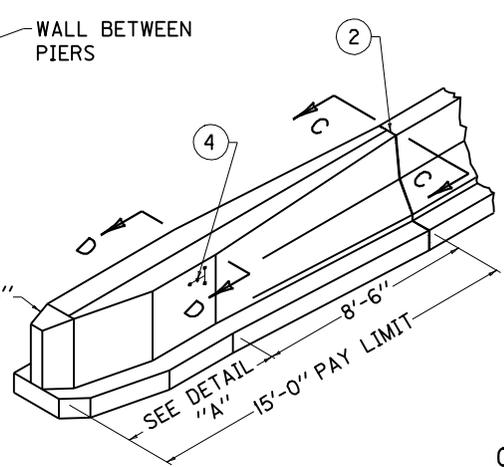
SUBMITTED: *David Kutt* 11-21-07
DIRECTOR DIVISION OF DESIGN DATE
APPROVED: *Matthew A. Anderson* 11-21-07
STATE HIGHWAY ENGINEER DATE

~ NOTES ~

1. BID ITEMS AND UNIT TO BID:
 - A. CONCRETE MEDIAN BARRIER END
 - a. STEEL REINFORCEMENT - POUNDS (MIN. GRADE 40).
 - b. CLASS "A" CONCRETE - CUBIC YARDS (INCLUDES ALL MATERIALS, TOOLS, FORMS, LABOR, EXCAVATION, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN ACCORDANCE WITH THIS DRAWING).
- ② 1/2" PREMOLDED EXPANSION JOINT MATERIAL REQUIRED.
3. STEEL REINFORCING BARS SHALL BE EVENLY SPACED AS SHOWN.
- ④ 4-BOLT INSERT ASSEMBLIES ARE REQUIRED. (SEE CURRENT STD. DWG. RBC-100 FOR INSERT DETAIL).
- ⑤ CONCRETE QUANTITIES AT BRIDGE PIERS ARE BASED ON A BRIDGE PIER WIDTH OF 3'-0".
- ⑥ WHEN THE CONCRETE MEDIAN BARRIER END IS PLACED AT A PIER WIDER THAN 3'-0" THE BARRIER END TRANSITION SHALL BE CONSTRUCTED ON A 12:1 MIN. TAPER AND ADDITIONAL CONCRETE AND STEEL QUANTITIES SHALL BE CALCULATED.



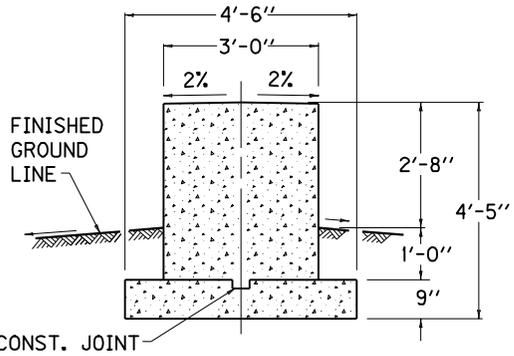
BARRIER END FOR VERTICAL WALL BETWEEN BRIDGE PIERS



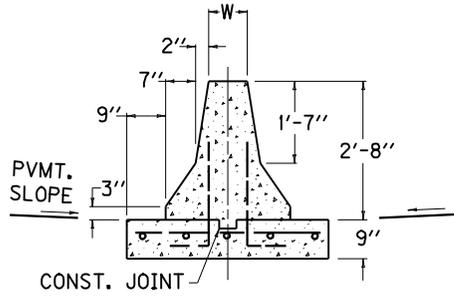
BARRIER END FOR CONCRETE MEDIAN BARRIER

QUANTITIES FOR ONE CONCRETE MEDIAN BARRIER END

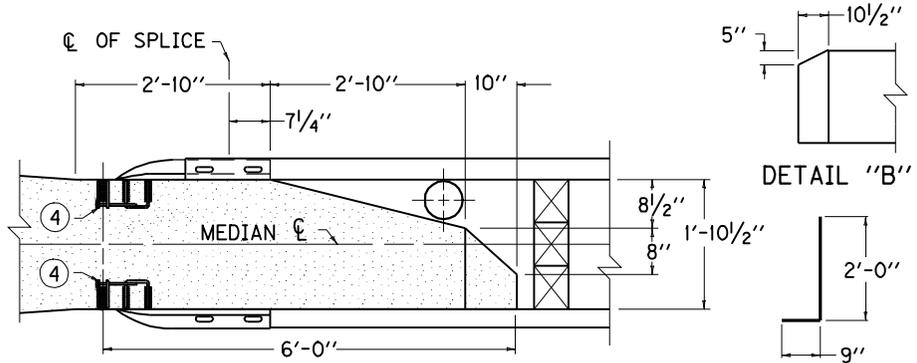
CONDITION	NO. 5 STEEL REINF. BARS						POUNDS OF STEEL	CU. YDS. CLASS "A" CONC.
	① QTY.	LGTH.	② QTY.	LGTH.	③ QTY.	LGTH.		
BARRIER END AT BRIDGE PIERS								⑤ 5.73
9" WALL	30	2'-9"	5	14'-4"	15	2'-3"	196	3.71
12" WALL								3.87
14" WALL								3.96



SECTION A-A (WALL BETWEEN BRIDGE PIERS)

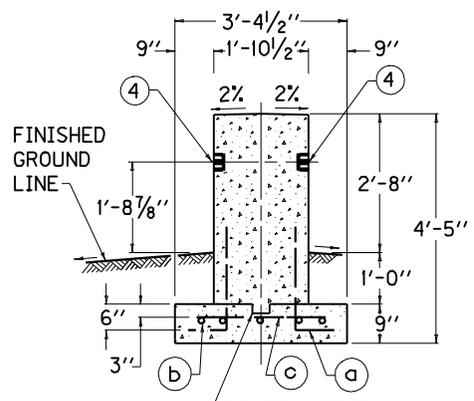


SECTION C-C

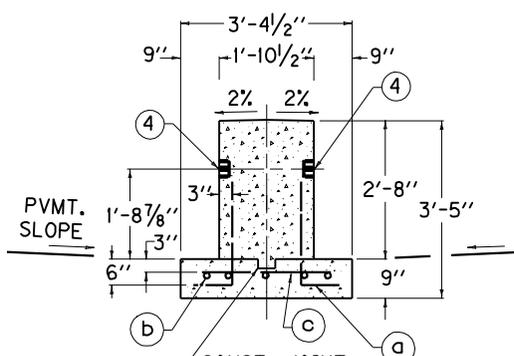


DETAIL "A"

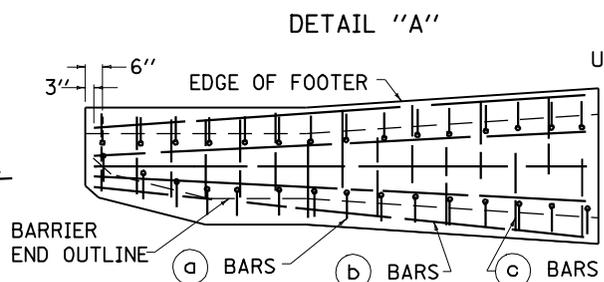
DETAIL "B"



SECTION B-B



SECTION D-D



TYPICAL STEEL PLACEMENT

BAR ① DETAIL

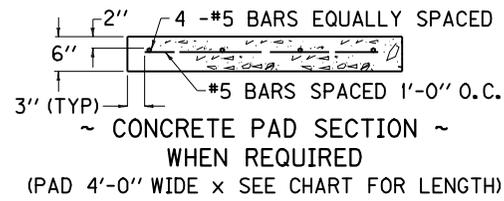
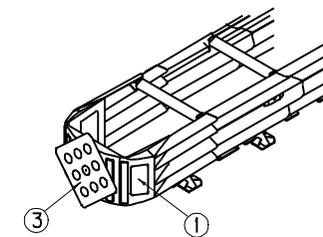
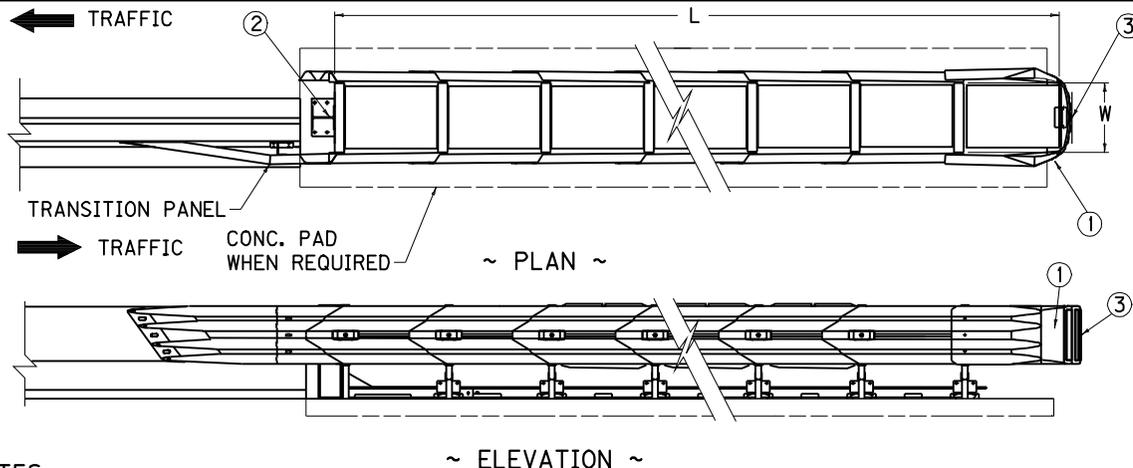
USE WITH CUR. STD. DWG. RBE-200

KENTUCKY DEPARTMENT OF HIGHWAYS

CONCRETE MEDIAN BARRIER END FOR CRASH CUSHION TYPE IX

STANDARD DRAWING NO. RBE-070-04

SUBMITTED: *David Kutt* 11-21-07
 DIRECTOR DIVISION OF DESIGN DATE
 APPROVED: *Matthew A. [Signature]* 11-21-07
 STATE HIGHWAY ENGINEER DATE



~NOTES~

1. CRASH CUSHION TYPE VI, CLASS , ,
 - CLASS B OR C, AS REQUIRED
 - EITHER TEST LEVEL 2 (TL2) OR TEST LEVEL 3 (TL3), AS REQUIRED.
 - SEE "CONNECTION DETAILS OF CRASH CUSHION TYPE VI TO DOUBLE FACE GUARDRAIL".
2. CRASH CUSHION TYPE VI-BT OR CT IS DEPICTED ATTACHED TO A CONCRETE BARRIER (TEMPORARY).
3. WHEN CRASH CUSHION TYPE VI-BT OR CT IS ATTACHED TO STEEL "W" BEAM GUARDRAIL (DOUBLE FACE), ALL APPLICABLE DETAILS SHOWN ON CUR. STD. DWG. [RBC-110](#) , "CONNECTION DETAIL OF CRASH CUSHION TYPE VI TO DOUBLE FACE GUARDRAIL" SHALL BE REQUIRED.
4. WHEN CRASH CUSHION TYPE VI-BT OR CT IS ATTACHED TO STEEL "W" BEAM GUARDRAIL (DOUBLE FACE), THE TRANSITION PANEL SHALL BE ELIMINATED.
5. IN A TWO-WAY TRAFFIC SITUATION FOR A 6" OR 9" TOP WIDTH WALL THE UNIT SHALL BE OFFSET FROM THE CENTERLINE OF THE WALL AS SHOWN IN THE PLAN VIEW. FOR A 12" TOP WIDTH WALL, THE UNIT SHALL BE CENTERED ON THE END OF THE BARRIER.
6. FOR ONE-WAY APPROACH TRAFFIC THE UNIT SHALL BE CENTERED ON THE END OF THE BARRIER.
7. THE COMPLETE INSTALLATION SHALL MEET ALL APPLICABLE REQUIREMENTS OF ENERGY ABSORPTIONS INC., TRINITY INDUSTRIES INC. OR SCI PRODUCTS INC. (SEE APPROVED SHOP DRAWINGS).
8. ANCHORAGE DEVICES TO SECURE CRASH CUSHION TO THE EXISTING SURFACE SHALL BE SHOWN ON APPROVED SHOP DRAWINGS.
9. WHEN REQUIRED, THE CONCRETE PAD, PAD EXCAVATION AND STEEL REINFORCEMENT, INSTALLED IN PLACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CRASH CUSHION TYPE VI. USE CLASS AA CONCRETE TO CONSTRUCT CONCRETE PAD (SEE CONCRETE PAD SECTION FOR STEEL REQUIREMENTS). THE PAD SHALL BE CURED AND FINISHED AS EITHER SIDEWALK OR PAVEMENT. THE CROSS SLOPE OF THE PAD OR PAVEMENT SHALL NOT EXCEED 5%. THE PAD WILL NOT BE REQUIRED WHEN UNIT IS CONSTRUCTED ON RIGID PAVEMENT.
10. THE PAD WILL NOT BE REQUIRED WHEN THE UNIT IS CONSTRUCTED ON EXISTING PAVEMENT OR BRIDGES AND THE COST OF ANCHORING SHALL BE INCLUDED IN THE UNIT PRICE OF THE CRASH CUSHION.
11. USE WITH CURRENT STANDARD DRAWING [RBC-110](#) WHEN CONNECTING TO DOUBLE FACE GUARDRAIL.
12. PERMISSABLE ALTERNATES FOR CRASH CUSHION TYPE VI-BT OR CT ARE PATENTED (ONE SOURCE) ITEMS: ENERGY ABSORPTION SYSTEMS, INC. OF CHICAGO, IL., TRINITY INDUSTRIES, INC. OF DALLAS, TX. OR SCI. PRODUCTS, INC. OF ST. CHARLES, IL.

CLASS	SPEED (MPH)	ATTENUATOR			APPROX. CU. YD. CONC. FOR PAD	SUGGESTED ADT* RANGE (P.C.P.L.)**
		MODEL	PRODUCT NAME	LENGTH		
B	45 & LESS	TL2	SHORTTRACC	14'-0"	1.12	UP TO 12,000
			3-BAY QUADGUARD	12'-0"	0.87	
	OVER 45	TL3	TRACC	21'-0"	1.63	
			6-BAY QUADGUARD	21'-0"	1.53	
C	OVER 45	TL3	SC1100GM	23'-0"	1.7	8,000 AND OVER
			QUADGUARD ELITE	26'-7"	1.98	

- ~ LEGEND ~
- ① NOSE ASSEMBLY
 - ② CONSTRUCTION ZONE BACKUP
 - ③ OBJECT MARKER TYPE 1, (SEE CUR. MUTCD MANUAL FOR DETAILS) CENTER HORIZ. AND VERT.

USE WITH CUR. STD. DWG. [RBE-060](#) (SEE NOTE 11. FOR ACCOMPANYING DRAWINGS).

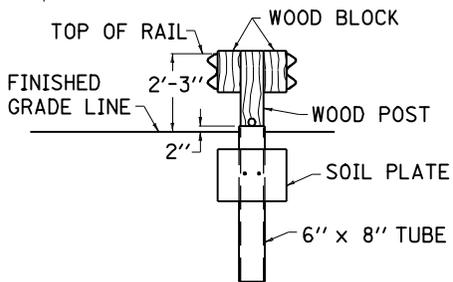
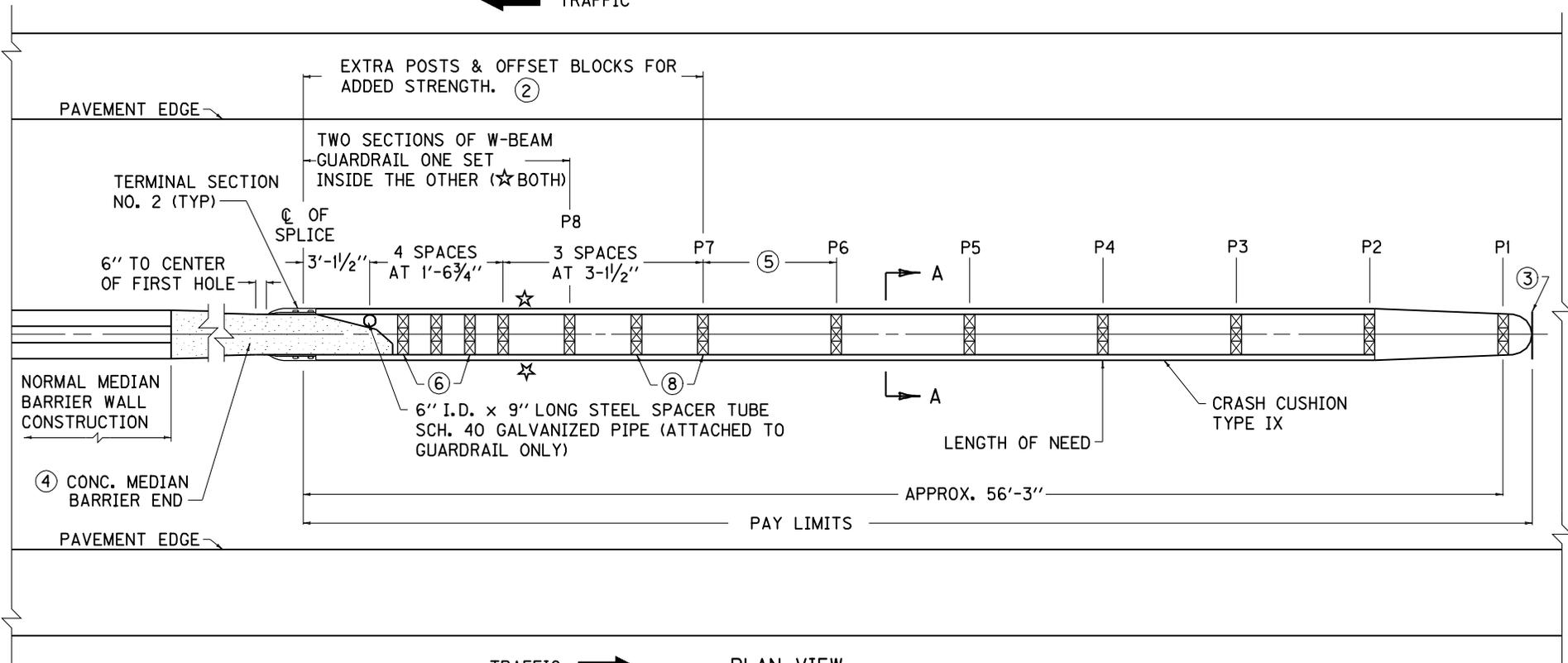
KENTUCKY
DEPARTMENT OF HIGHWAYS

CRASH CUSHION
TYPE VI-BT & CT

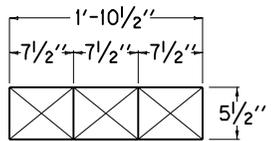
STANDARD DRAWING NO. RBE-100-09
 SUBMITTED: *David Kutt* 11-21-07
DIRECTOR DIVISION OF DESIGN DATE
 APPROVED: *Matthew A. [Signature]* 11-21-07
STATE HIGHWAY ENGINEER DATE

* AVERAGE DAILY TRAFFIC
 ** PASSENGER CARS PER LANE

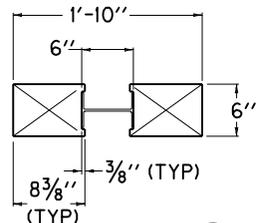
← TRAFFIC



SECTION A-A



WOOD POST (2)
WOOD OFFSET BLOCKS



STEEL POST (2)
WOOD OFFSET BLOCKS

PLAN VIEW

TRAFFIC →

~NOTES~

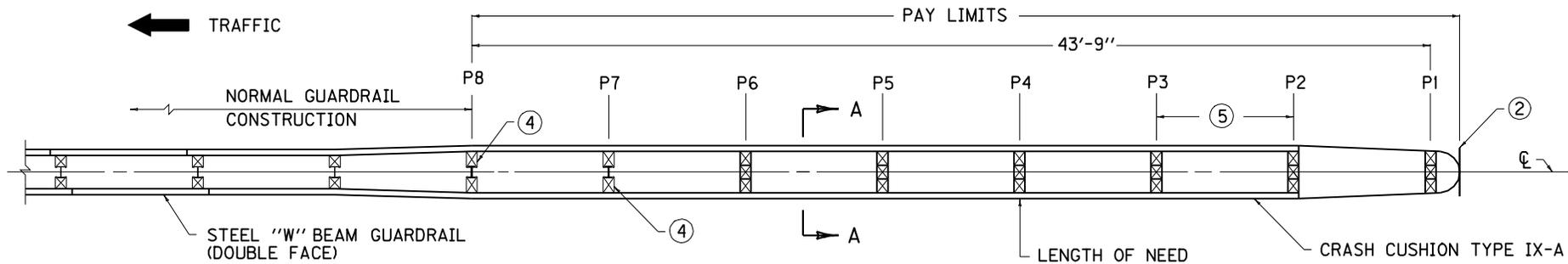
1. CRASH CUSHION TYPE IX SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND INCLUDES TERMINAL SECTIONS NO. 2, POST, RAIL ELEMENTS, OBJECT MARKER TYPE I, AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION AS DETAILED.
- (2) POSTS AND OFFSET BLOCKS MAY BE WOOD OR STEEL POST AND WOOD OFFSET BLOCKS.
- (3) OBJECT MARKER TYPE I, (SEE CURRENT MUTCD MANUAL FOR DETAILS) CENTER HORIZ. AND VERT.
- (4) SEE CUR. STD. DWG. [RBE-070](#) FOR DETAILS OF CRASH CUSHION BARRIER END.
- (5) POST P1 THROUGH P7 ARE SPACED 6'-3" ON CENTER.
- (6) GUARDRAIL NOT REQUIRED TO BE ATTACHED TO POST AT THESE LOCATIONS.
7. CRASH CUSHION TYPE IX IS A PATENTED (ONE SOURCE) PRODUCT MANUFACTURED BY TRINITY INDUSTRIES, INC. OF DALLAS TX. OR ROAD SYSTEMS, INC. OF BIG SPRING, TX.
- (8) BACK-UP PLATES REQUIRED AT THESE POSTS.
9. THE MANUFACTURER SHALL FURNISH TWO (2) SETS OF SHOP PLANS TO THE CONTRACTOR WITH EACH INSTALLATION.
10. FOR NON-PAVEMENT APPLICATIONS SEE ROADWAY PLANS FOR GRADING DETAILS

USE WITH CURRENT
STD. DWG. [RBE-070](#)
KENTUCKY
DEPARTMENT OF HIGHWAYS

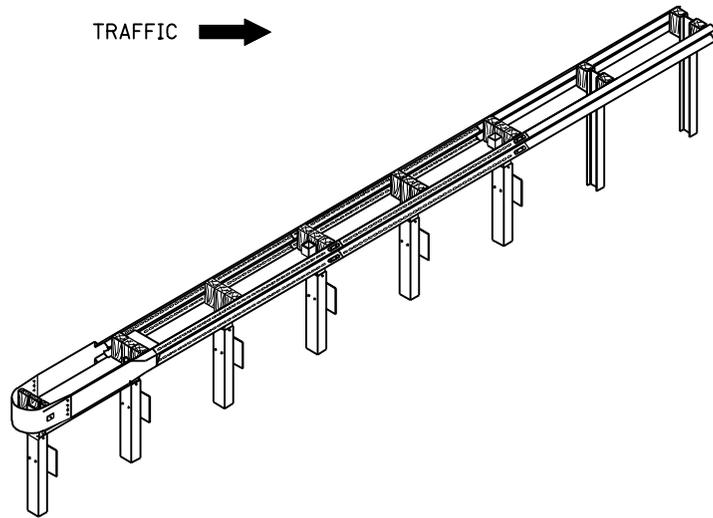
CRASH CUSHION
TYPE IX

STANDARD DRAWING NO. RBE-200-04

SUBMITTED: *David Kutt* 11-21-07
DIRECTOR DIVISION OF DESIGN DATE
APPROVED: *Matthew W. [Signature]* 11-21-07
STATE HIGHWAY ENGINEER DATE

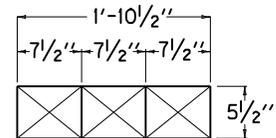


TRAFFIC →

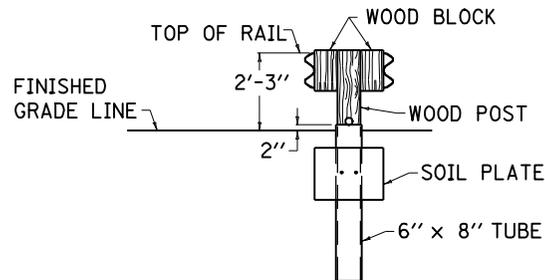


CRASH CUSHION TYPE IX-A
ISOMETRIC VIEW

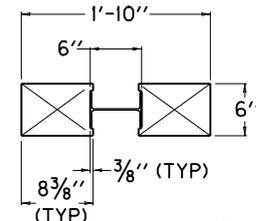
PLAN VIEW



WOOD POST ④
WOOD OFFSET BLOCKS



SECTION A-A



STEEL POST ④
WOOD OFFSET BLOCKS

~ NOTES ~

1. CRASH CUSHION TYPE IX-A SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND INCLUDES POSTS, RAIL ELEMENTS, OBJECT MARKER TYPE I AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION AS DETAILED.
- ② OBJECT MARKER TYPE I, (SEE CURRENT MUTCD MANUAL FOR DETAILS) CENTER HORIZ. AND VERT.
3. CRASH CUSHION TYPE IX-A IS A PATENTED (ONE SOURCE) PRODUCT MANUFACTURED BY TRINITY INDUSTRIES, INC. OF DALLAS, TX. OR ROAD SYSTEMS, INC. OF BIG SPRING, TX.
- ④ AT POST P7 AND P8 THE POSTS AND OFFSET BLOCKS MAY BE WOOD OR STEEL POST AND WOOD OFFSET BLOCKS.
- ⑤ POST P1 THROUGH P8 ARE SPACED 6'-3" ON CENTER.
6. BACK-UP PLATES REQUIRED AT POST P7.
7. THE MANUFACTURER SHALL FURNISH TWO (2) SETS OF SHOP PLANS TO THE CONTRACTOR WITH EACH INSTALLATION.
8. FOR NON-PAVEMENT APPLICATIONS SEE ROADWAY PLANS FOR GRADING DETAILS.

KENTUCKY
DEPARTMENT OF HIGHWAYS

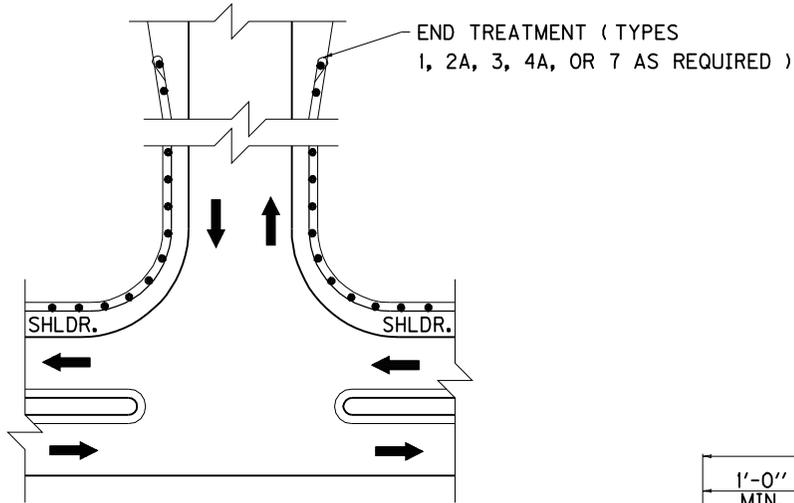
CRASH CUSHION
TYPE IX-A

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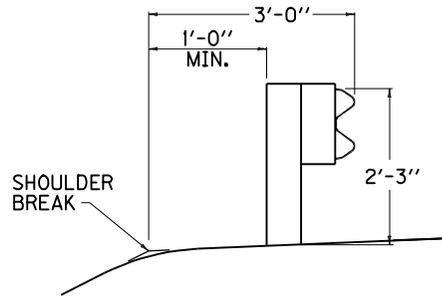
SUBMITTED	<i>David Kutt</i>	11-21-07
DIRECTOR DIVISION OF DESIGN		DATE
APPROVED	<i>Matthew A. [Signature]</i>	11-21-07
STATE HIGHWAY ENGINEER		DATE

~ NOTES ~

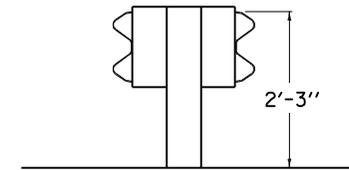
1. FOR END TREATMENT TYPE 4A USE CUR. STD. DWG. [RBR-035](#) FOR OFFSETS.
2. THE MINIMUM LENGTH OF GUARDRAIL, INCLUDING THE END TREATMENT, PRECEDING A FIXED OBJECT IS 200 FEET: (LENGTH MAY BE REDUCED SHOULD FIELD CONDITIONS WARRANT).



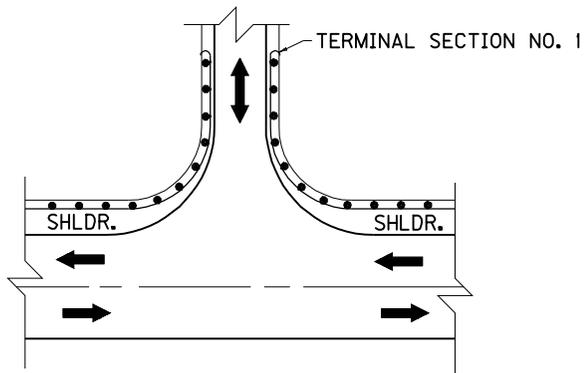
APPROACH ROADS



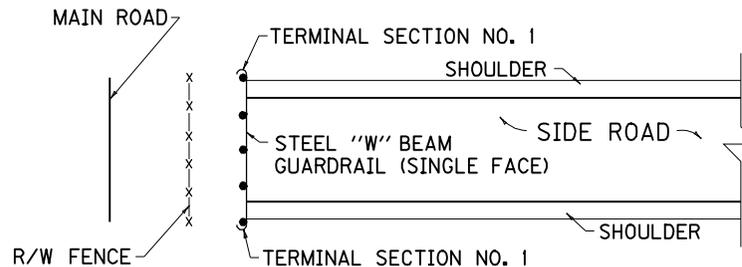
NORMAL GUARDRAIL INSTALLATION



TYPICAL DOUBLE FACE GUARDRAIL INSTALLATION



ENTRANCES



GUARDRAIL USED AS A BARRICADE

USE WITH CUR. STD. DWG. [RBI-002](#)

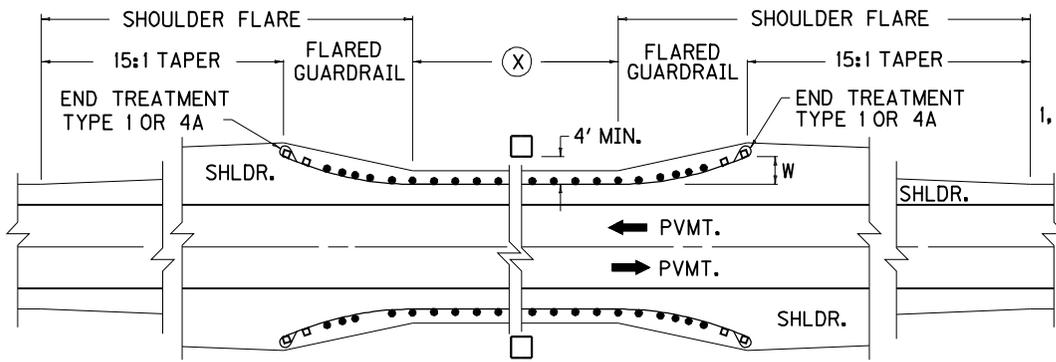
KENTUCKY
DEPARTMENT OF HIGHWAYS

TYPICAL GUARDRAIL
INSTALLATIONS

STANDARD DRAWING NO. RBI-001-09

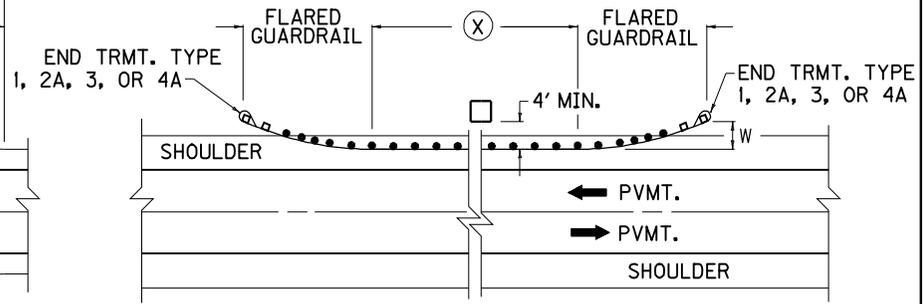
SUBMITTED *Alan W. Shears* 12-2-02
DIRECTOR DIVISION OF DESIGN DATE

APPROVED *F. M. Howell* 12-2-02
STATE HIGHWAY ENGINEER DATE



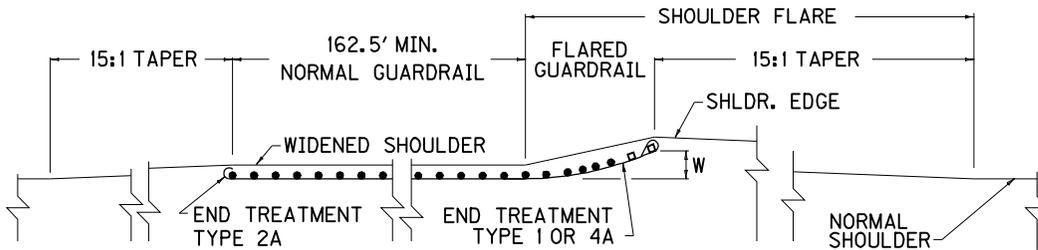
AT A FIXED OBJECT - TWO WAY TRAFFIC (FILL)

FIGURE 1



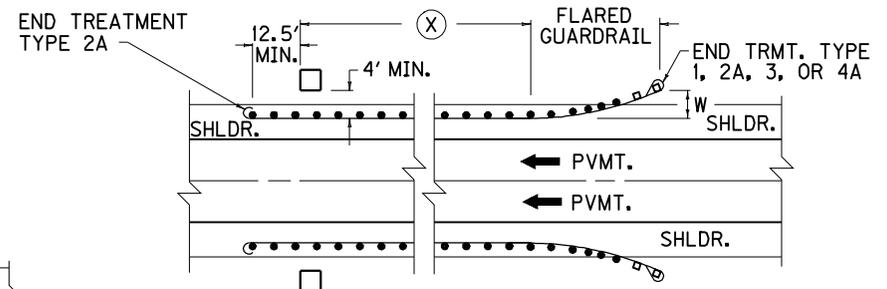
AT A FIXED OBJECT - TWO WAY TRAFFIC (CUT)

FIGURE 4



ONE DIRECTION TRAFFIC-FOR SHOULDERS LESS THAN 12' (FILL)

FIGURE 2



AT A FIXED OBJECT - ONE WAY TRAFFIC (CUT)

FIGURE 5

~ NOTES ~

GENERAL APPLICATION OF END TREATMENTS

- (a.) ALL FILLS; ALSO SOLID ROCK CUTS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL, USE END TREATMENT TYPE 1.
- (b.) SOLID ROCK CUTS WITHOUT ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL, USE END TREATMENT TYPE 2A.
- (c.) EARTH CUTS AND SOFT ROCK CUTS, USE END TREATMENT TYPE 3.
- (d.) ALL FILLS; ALSO SOLID ROCK CUTS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL, USE END TREATMENT TYPE 4A.

(X) NORMAL GUARDRAIL INSTALLATION. FOR FIXED OBJECTS, SPECIFY "X" IN 12'-6" INCREMENTS.

□ FIXED OBJECTS SUCH AS (PIERS, NEAR OR AT GRADE CULVERTS, POST, OR POLE LOCATED IN THE SAFETY ZONE AND NOT HAVING BREAKAWAY FEATURE. SEE APPROPRIATE CURRENT STANDARD DRAWING FOR PROPER OFFSET "W".

THE MINIMUM LENGTH OF GUARDRAIL, INCLUDING THE END TREATMENT, PRECEDING A FIXED OBJECT IS 200 FEET (LENGTH MAY BE REDUCED SHOULD FIELD CONDITIONS WARRANT).

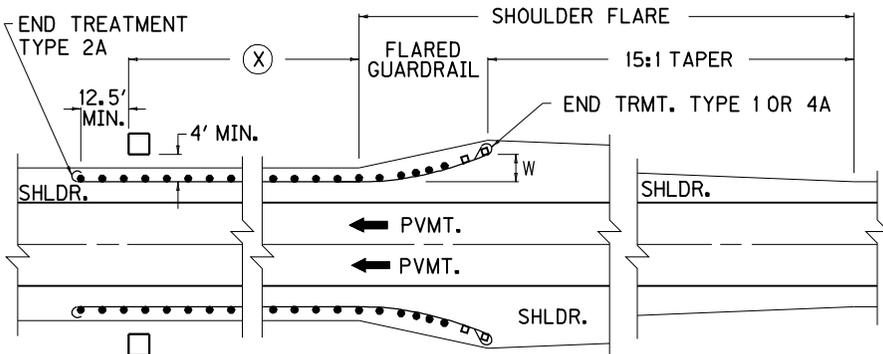
(USE WITH CURRENT STD. DWGS. RBI-003, RBI-004, RBR-030, RBR-035)

KENTUCKY
DEPARTMENT OF HIGHWAYS

TYPICAL GUARDRAIL
INSTALLATIONS

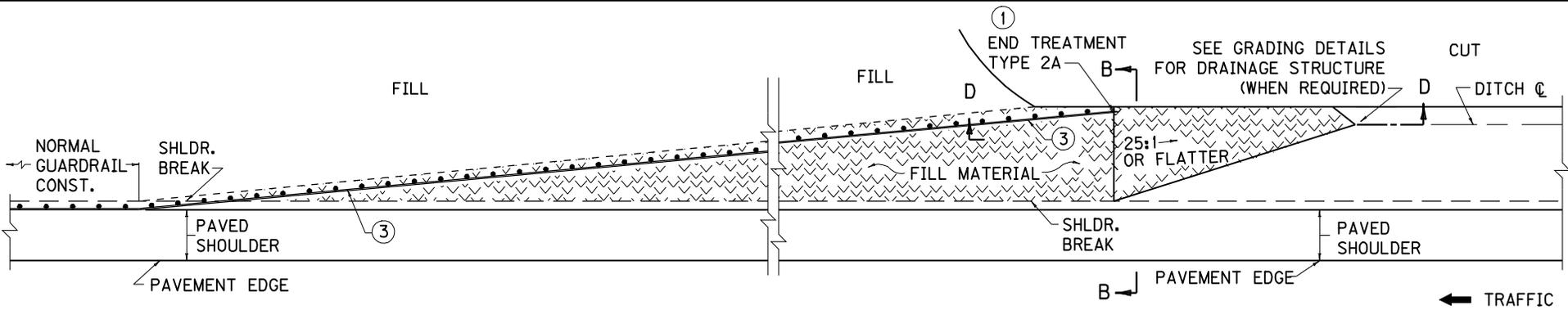
STANDARD DRAWING NO. RBI-002-06

SUBMITTED *John B. Anshutz* 12-1-99
DIRECTOR DIVISION OF DESIGN DATE
APPROVED *J. M. Howell* 12-1-99
STATE HIGHWAY ENGINEER DATE

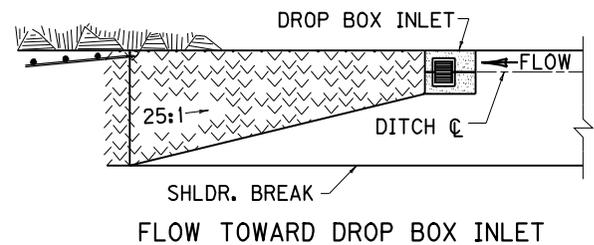
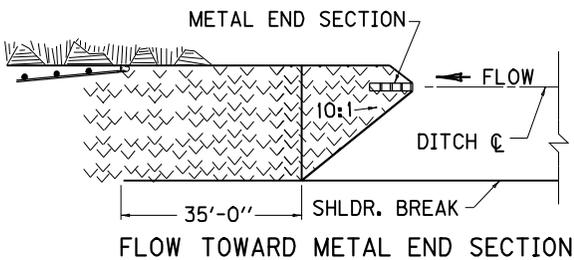


AT A FIXED OBJECT - ONE WAY TRAFFIC (FILL)

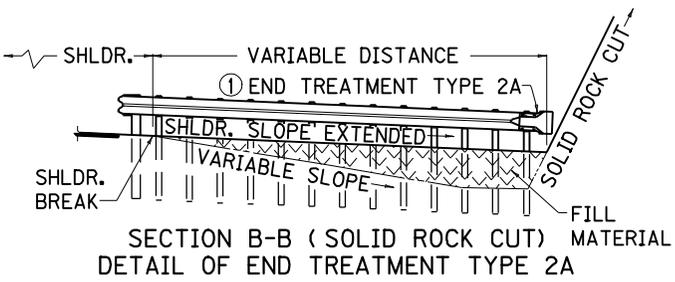
FIGURE 3



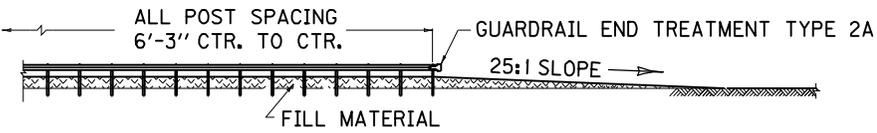
~ DETAIL OF GUARDRAIL FOR FILL TO SOLID ROCK CUT SECTION ~



GRADING DETAILS



- NOTES: BID ITEMS AND UNIT TO BID:**
- A. GUARDRAIL END TREATMENT TYPE 2A - EACH
 - B. ROADWAY OR BORROW EXCAVATION, OR EMBANKMENT IN PLACE - CU. YD.
 - C. DRAINAGE STRUCTURE BID SEPARATELY.
- GUARDRAIL END TREATMENT TYPE 2A**
- ① SOLID ROCK CUTS WITHOUT AN ADEQUATE RECOVERY ZONE.
 - 2. INTENDED USE: FOR END TREATMENTS AGAINST SOLID ROCK CUTS ONLY. END TREATMENT SHALL NOT ABUT LOOSE ROCK. FOR INSTALLATION WHERE SOLID ROCK IS NOT ENCOUNTERED SEE CURRENT STANDARD DRAWING [RBR-030](#).



SECTION D-D (GUARDRAIL END TREATMENT TYPE 2A)

	③		
DESIGN SPEED	70+ MPH	60 MPH	50 MPH OR LESS
FLARE RATES	15:1	13:1	11:1

USE WITH CUR. STD. DWGS.
 RBI-001, RBI-002, RDB-005

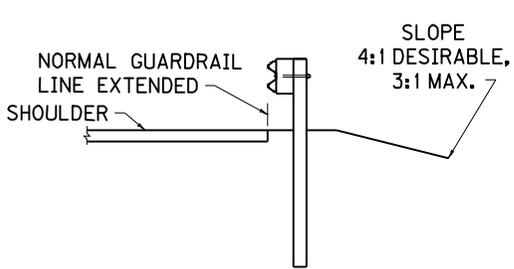
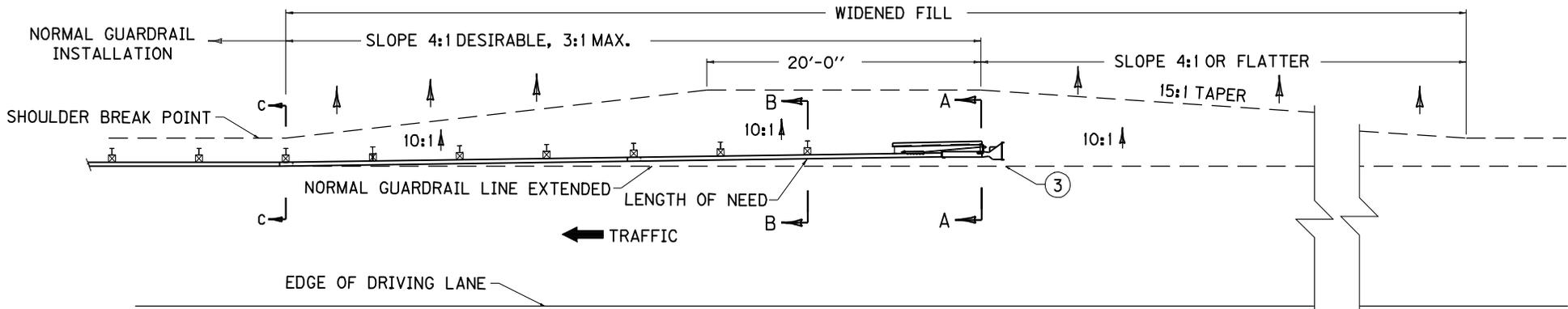
KENTUCKY
 DEPARTMENT OF HIGHWAYS

TYPICAL INSTALLATION
 FOR GUARDRAIL END
 TREATMENT TYPE 2A

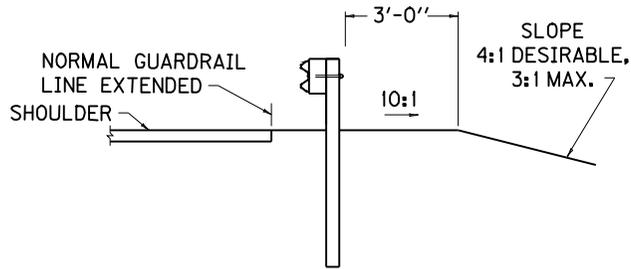
STANDARD DRAWING NO. RBI-003-07

SUBMITTED: *Alan W. Shipes* 12-2-02
DIRECTOR DIVISION OF DESIGN DATE

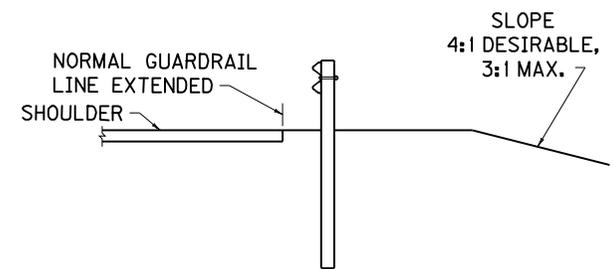
APPROVED: *J. M. Howell* 12-2-02
STATE HIGHWAY ENGINEER DATE



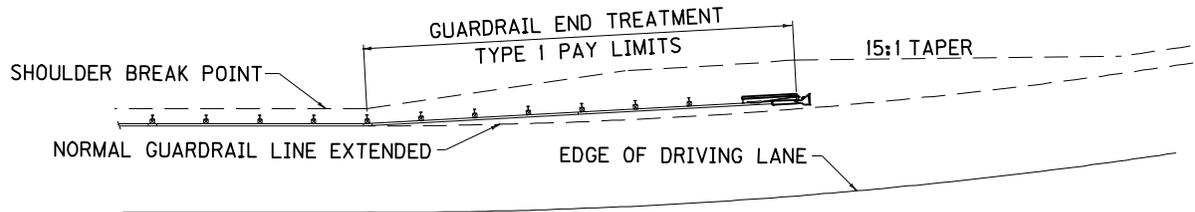
SECTION C-C



SECTION B-B



SECTION A-A



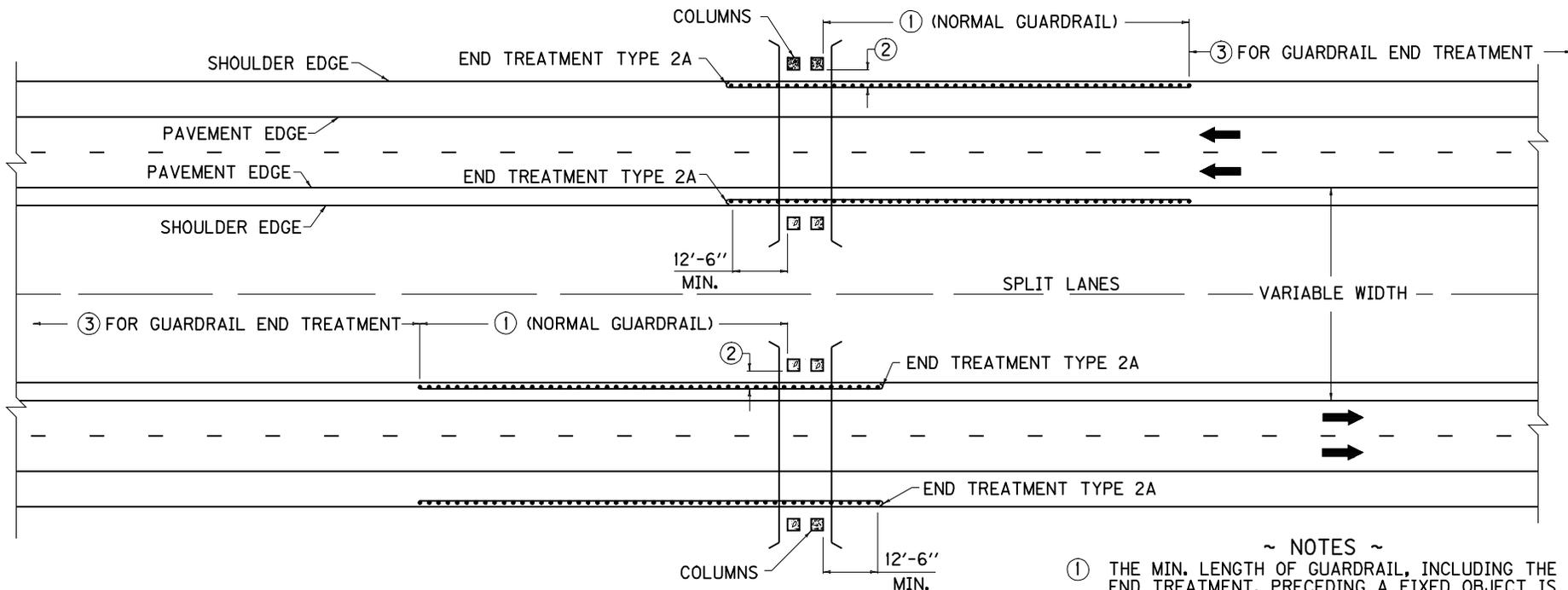
GUARDRAIL END TREATMENT TYPE 1
INSTALLED ON A CURVE (4)

1. BID ITEMS AND UNIT TO BID:
 - A. GUARDRAIL END TREATMENT TYPE 1 - EACH
 - B. MATERIAL USED TO CONSTRUCT WIDENING SHALL BE BID AS ROADWAY OR BORROW EXCAVATION OR EMBANKMENT-IN-PLACE AT THE CONTRACT UNIT PRICE PER CUBIC YARD.
2. THE MINIMUM LENGTH OF GUARDRAIL, INCLUDING THE END TREATMENT, PRECEDING A FIXED OBJECT IS 200 FEET (LENGTH MAY BE REDUCED SHOULD FIELD CONDITIONS WARRANT).

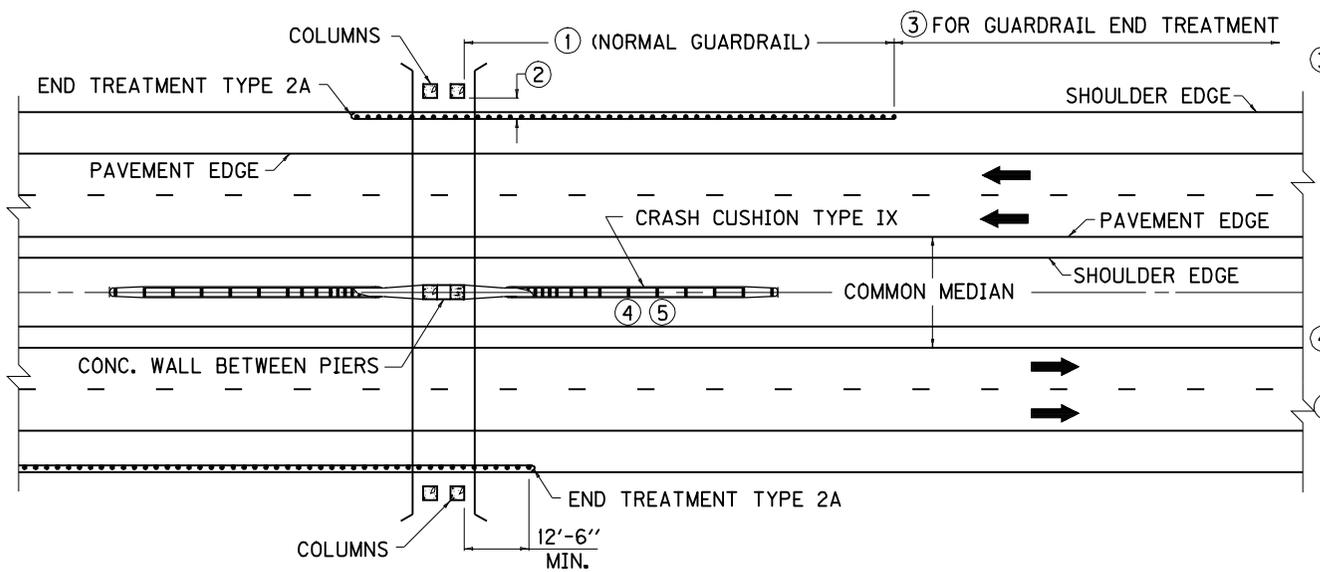
- (3) GUARDRAIL EXTRUDER EDGE CLOSEST TO TRAFFIC SHALL BE PLACED ON NORMAL GUARDRAIL LINE.
- (4) END TREATMENT TYPE 1 MAY BE ATTACHED TO CURVED GUARDRAIL PROVIDED CURVE IS 9° OR LESS. END TREATMENT TYPE 1 SHALL BE INSTALLED ON A STRAIGHT LINE TAPER WITHIN THE PAY LIMITS.
5. INTENDED USE: FILLS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL.

USE WITH CUR. STD. DWG. RBR-020

KENTUCKY DEPARTMENT OF HIGHWAYS	
INSTALLATION OF GUARDRAIL END TREATMENT TYPE 1	
STANDARD DRAWING NO. RBI-004-03	
SUBMITTED <i>David Kutt</i>	11-21-07 <small>DATE</small>
APPROVED <i>Matthew W. [Signature]</i>	11-21-07 <small>DATE</small>
<small>DIRECTOR DIVISION OF DESIGN</small>	<small>STATE HIGHWAY ENGINEER</small>



LOCATION OF GUARDRAIL WITH VARIABLE WIDTH MEDIAN



LOCATION OF GUARDRAIL WITH CONSTANT WIDTH MEDIAN

~ NOTES ~

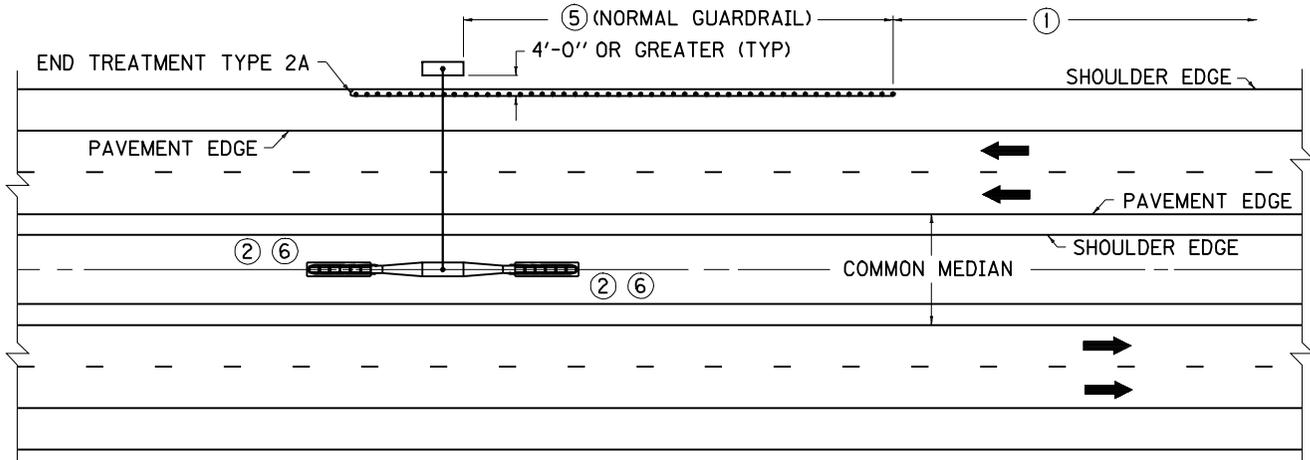
- ① THE MIN. LENGTH OF GUARDRAIL, INCLUDING THE END TREATMENT, PRECEDING A FIXED OBJECT IS 200 FEET (LENGTH MAY BE REDUCED SHOULD FIELD CONDITIONS WARRANT).
- ② 4'-0" OR MORE FROM NORMAL GUARDRAIL ALIGNMENT. HOWEVER, IF COLUMNS, PIERS, ABUTMENTS, ETC. ARE LOCATED IN THE CLEAR ZONE DISTANCE OR 30'-0" WHICHEVER IS GREATER FROM THE EDGE OF A THROUGH TRAVEL LANE, GUARDRAIL SHALL NOT BE REQUIRED.
- ③ TO TERMINATE GUARDRAIL INSTALLATION :
 A. ALL FILLS, ALSO SOLID ROCK CUTS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL; USE END TREATMENT TYPE 1.
 B. SOLID ROCK CUTS WITHOUT ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL ; USE END TREATMENT TYPE 2A.
 C. EARTH CUTS AND SOFT ROCK CUTS; USE END TREATMENT TYPE 3.
 D. ALL FILLS, ALSO SOLID ROCK CUTS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL; USE END TREATMENT TYPE 4A.
- ④ SEE CURRENT STD. DWG. **RBI-007** OR CURRENT STD. DWG. **RBI-009** AS APPLICABLE.
- ⑤ WHEN CONC. MEDIAN BARRIER WALL IS REQUIRED SEE CUR. STD. DWG. **RBM-015** FOR APPLICABLE DETAILS.

KENTUCKY
DEPARTMENT OF HIGHWAYS

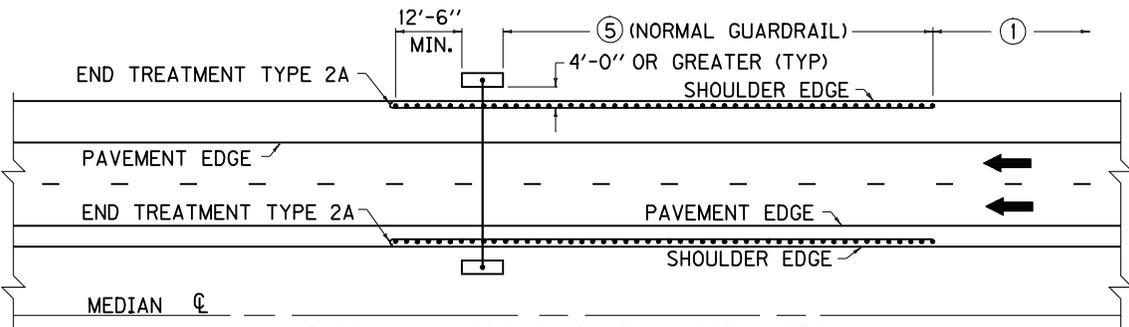
GUARDRAIL
INSTALLATION AT
BRIDGE COLUMNS

STANDARD DRAWING NO. RBI-005-07

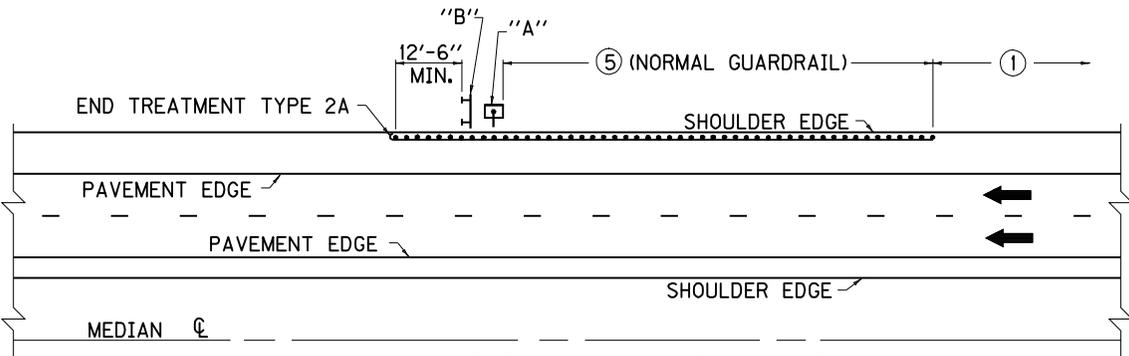
SUBMITTED *David Kutt* 11-21-07
 DIRECTOR DIVISION OF DESIGN DATE
 APPROVED *Matthew Anderson* 11-21-07
 STATE HIGHWAY ENGINEER DATE



TYPICAL GUARDRAIL INSTALLATIONS FOR OVERHEAD SIGN SUPPORT - TRUSS (RAISED MEDIAN)



TYPICAL GUARDRAIL INSTALLATIONS FOR OVERHEAD SIGN SUPPORT - TRUSS (DEPRESSED MEDIAN)



TYPICAL GUARDRAIL INSTALLATIONS FOR "A" CANTILEVER SIGN SUPPORT OR "B" OVERHEAD SIGN SUPPORT

~ NOTES ~

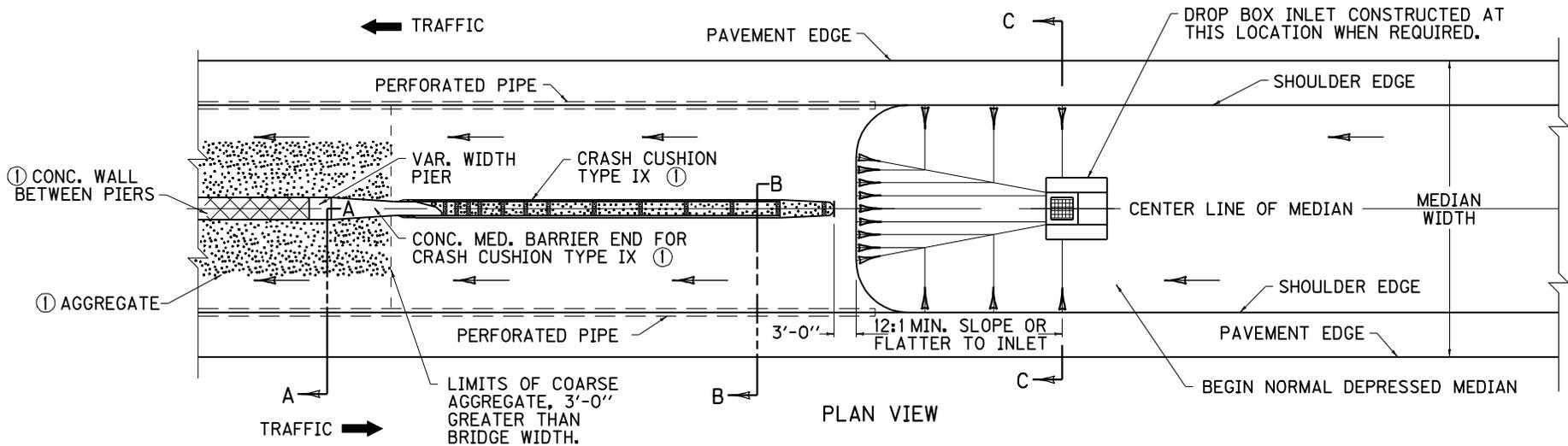
- ① TO TERMINATE GUARDRAIL INSTALLATION :
 A. ALL FILLS, ALSO SOLID ROCK CUTS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL; USE END TREATMENT TYPE 1.
 B. SOLID ROCK CUTS WITHOUT ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL ; USE END TREATMENT TYPE 2A.
 C. EARTH CUTS AND SOFT ROCK CUTS; USE END TREATMENT TYPE 3.
 D. ALL FILLS, ALSO SOLID ROCK CUTS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL; USE END TREATMENT TYPE 4A.
- ② SEE CURRENT STD. DWG. [RBI-009](#) FOR APPLICABLE CRASH CUSHION.
- 3. IF GAPS OF 200 FEET OR LESS SHOULD OCCUR BETWEEN SECTIONS OF GUARDRAIL, THE GUARDRAIL SHALL BE EXTENDED THROUGH SUCH GAPS TO PROVIDE A COUNTINUOUS SECTION.
- 4. GUARDRAIL INSTALLATION IS NOT NECESSARY FOR SIGNS MOUNTED ON:
 A. CHANNEL POST IN TYPE "B" OR "C" BASES.
 B. TYPE "B" BREAKAWAY BEAMS.
 C. SIGNS MOUNTED IN CAST ALUMINUM SHOES. (SEE SIGN PLAN).
- ⑤ THE MIN. LENGTH OF GUARDRAIL, INCLUDING THE END TREATMENT, PRECEDING A FIXED OBJECT IS 200 FEET (LENGTH MAY BE REDUCED SHOULD FIELD CONDITIONS WARRANT).
- ⑥ WHEN CONCRETE BARRIER WALL IS REQUIRED SEE CUR. STD. DWG. [RBM-015](#) FOR APPLICABLE DETAILS.

KENTUCKY
DEPARTMENT OF HIGHWAYS

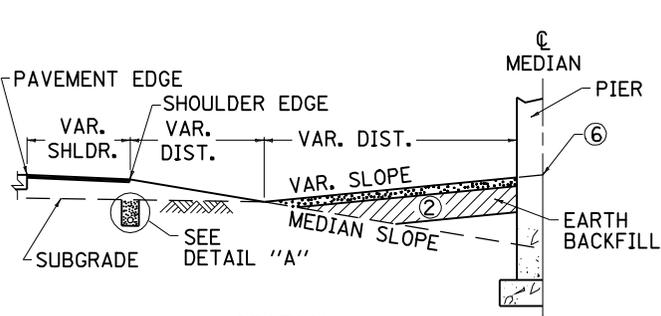
GUARDRAIL
INSTALLATION AT
SIGN SUPPORTS

STANDARD DRAWING NO. RBI-006-06

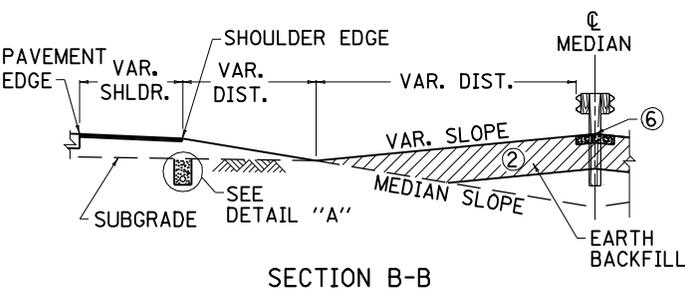
SUBMITTED *John B. Anderson* 12-1-99
DIRECTOR DIVISION OF DESIGN DATE
 APPROVED *J. M. Howell* 12-1-99
STATE HIGHWAY ENGINEER DATE



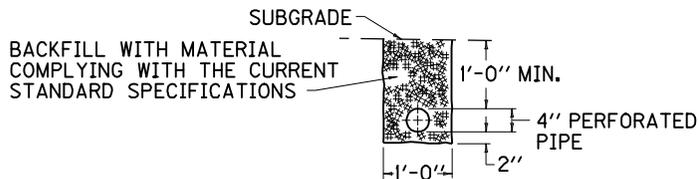
PLAN VIEW



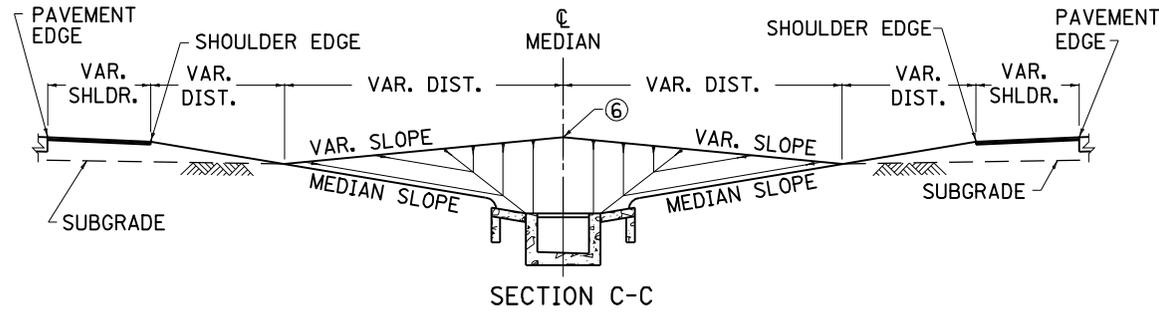
SECTION A-A



SECTION B-B



DETAIL "A"

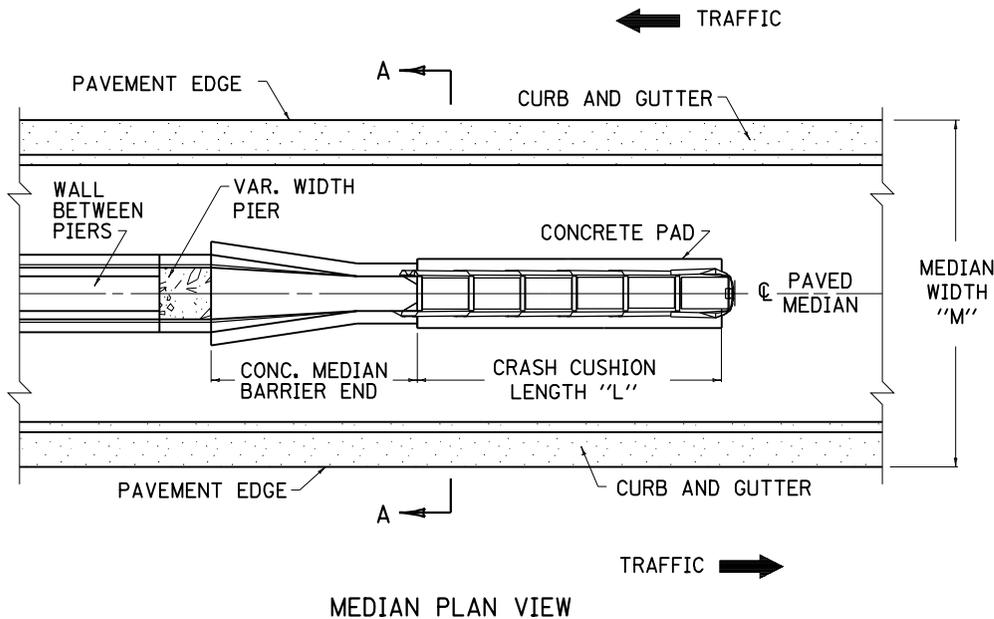


SECTION C-C

NOTES

- ① BID ITEMS AND UNIT TO BID:
 A. CRASH CUSHION TYPE IX - EACH (SEE CURRENT STD. DWG. [RBE-200](#))
 B. CONC. MED. BAR. END FOR CRASH CUSHION TYPE IX (SEE CUR. STD. DWG. [RBE-070](#) FOR PAY ITEMS)
 C. CLASS A CONCRETE - CUBIC YARD (CONC. WALL BETWEEN PIERS-SEE CURRENT STD. DWG. [RBE-070](#))
 D. ROADWAY OR BORROW EXCAVATION OR EMBANKMENT-IN-PLACE - CUBIC YARD
 E. CRUSHED AGGREGATE SIZE NO. 57 - TON
- ② WHEN SOLID ROCK IS ENCOUNTERED, THIS MATERIAL SHALL BE REMOVED AND BACKFILLED WITH EARTH (ROADWAY OR BORROW EXCAVATION OR EMBANKMENT-IN-PLACE), A DEPTH OF 2'-0".
3. WHEN CRASH CUSHION TYPE IX IS INSTALLED AT THE SUMMIT OF A VERTICAL CURVE, PERFORATED PIPE SHALL BE PLACED AS DETAILED IN BOTH DIRECTIONS. CONSTRUCT A PERFORATED PIPE HEADWALL AT EACH OUTLET OR EXTEND PIPE TO A BOX INLET. WHEN PERFORATED PIPE IS PLACED IN A SAG VERTICAL CURVE, IT SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER.
4. AREA IN DEPRESSED MEDIAN SHALL BE GRADED IN ORDER TO PROVIDE COMPLETE DRAINAGE.
5. THIS DRAWING DEPICTS THE APPLICATION OF MATERIALS NECESSARY TO COMPLETE THE INSTALLATION.
- ⑥ THIS POINT SAME ELEVATION AS INSIDE PAVEMENT EDGE.
7. 6" OF NO. 57 COARSE AGGREGATE (LOOSE DEPTH).

KENTUCKY	
DEPARTMENT OF HIGHWAYS	
CRASH CUSHION TYPE IX	
INSTALLATION AT	
MEDIAN PIERS	
(DEPRESSED MEDIAN)	
STANDARD DRAWING NO. RBI-007-08	
SUBMITTED <i>John B. ...</i>	12-1-99
DIRECTOR DIVISION OF DESIGN	DATE
APPROVED <i>J. M. ...</i>	12-1-99
STATE HIGHWAY ENGINEER	DATE

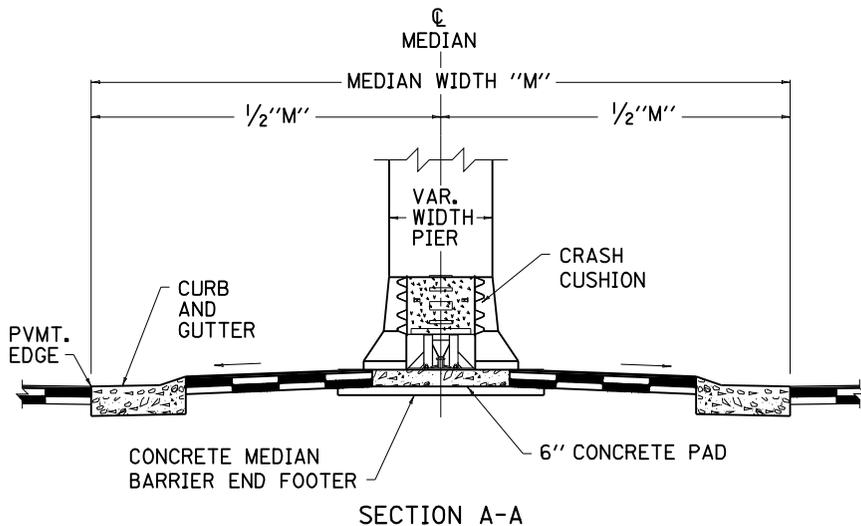


NOTES

A RAISED MEDIAN IS DEPICTED; HOWEVER, THE SAME WARRANTS WOULD GOVERN FOR A FLUSH MEDIAN.
 A CRASH CUSHION TYPE VI IS DEPICTED; HOWEVER, CRASH CUSHION TYPE IX SHALL BE PERMITTED SHOULD WARRANTS PERMIT.

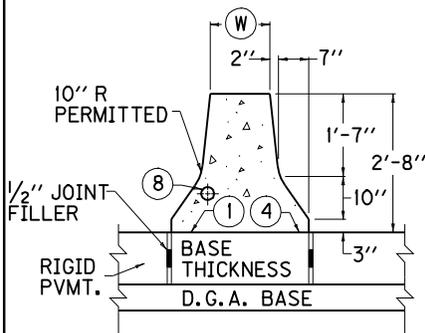
MATERIALS

CONCRETE MEDIAN BARRIER END FOR CRASH CUSHION TYPE VI OR CRASH CUSHION TYPE IX AS APPLICABLE.
 CONCRETE PAD FOR CRASH CUSHION TYPE VI.
 CRASH CUSHION TYPE VI (SEE CUR. STD. DWG. [RBE-060](#)), OR CRASH CUSHION TYPE IX (SEE CUR. STD. DWG. [RBE-200](#)) AS APPLICABLE.
 PAVED MEDIAN (SEE PLANS FOR MATERIAL).



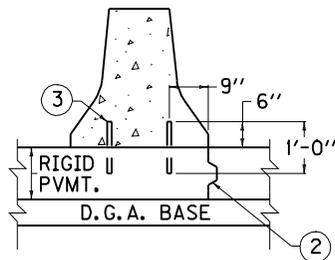
KENTUCKY DEPARTMENT OF HIGHWAYS		
CRASH CUSHION INSTALLATION AT MEDIAN PIERS (RAISED OR FLUSH MEDIAN)		
STANDARD DRAWING NO. RBI-009-03		
SUBMITTED <i>David Keith</i>	11-21-07	DATE
<small>DIRECTOR DIVISION OF DESIGN</small>		
APPROVED <i>Matthew W. [Signature]</i>	11-21-07	DATE
<small>STATE HIGHWAY ENGINEER</small>		

TYPE 9A,
12A OR 14A



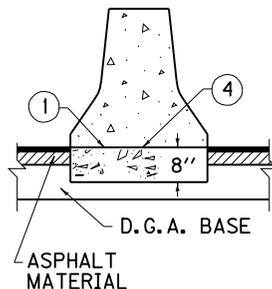
NEW RIGID PAVEMENT

TYPE 9B,
12B OR 14B

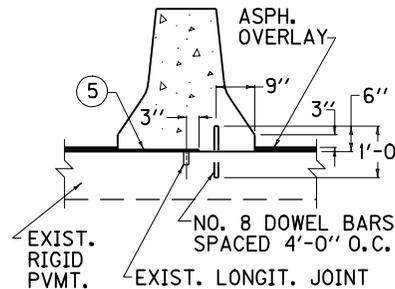


NEW FLEXIBLE PAVEMENT

TYPE 9C,
12C OR 14C

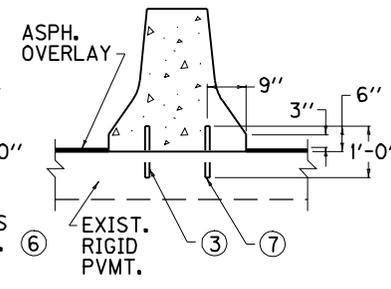


TYPE 9D,
12D OR 14D



NEW FLEXIBLE
OVERLAY OVER
EXISTING RIGID
PAVEMENT

TYPE 9E,
12E OR 14E



NEW FLEXIBLE
OVERLAY OVER
EXISTING FLEXIBLE
PAVEMENT

~ NOTES ~

THE BID ITEM SHALL BE: CONCRETE MEDIAN BARRIER TYPE \oplus $\opl�$

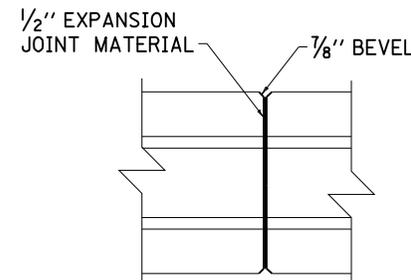
\oplus 9, 12, OR 14 DEPENDING ON W

$\opl�$ A, B, C, D, OR E DEPENDING ON PAVEMENT TYPE.

FOR WALLS IN TRANSITION AND SEPARATE SEGMENT WALLS SEE CURRENT STD. DWG. RBM-015 FOR APPROPRIATE BID ITEMS.

THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE MEDIAN BARRIER INCLUDING THE BASE IN TYPES A AND C SHALL BE FULL COMPENSATION FOR ALL MATERIALS, EQUIPMENT, LABOR AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.

- ① WHEN A CONSTRUCTION JOINT IS USED, DOWEL BARS WILL BE REQUIRED AS SHOWN WITH TYPE 9B, 12B, OR 14B BARRIER.
- ② LONGITUDINAL CONSTRUCTION JOINT WITHOUT TIE BARS IS REQUIRED AND SHALL BE PLACED AT THE LOCATION SHOWN OR MAY BE INSTALLED AT THE CORRESPONDING POINT ON THE OPPOSITE SIDE OF THE BARRIER, AT THE OPTION OF THE CONTRACTOR. IT SHALL BE REQUIRED ON THE LOW SIDE OF A SUPERELEVATED SECTION.
- ③ NO. 8 DOWEL BARS SPACED 4'-0" O.C. AND STAGGERED 2'-0".
- ④ CONSTRUCTION JOINT PERMITTED WHEN FIXED FORMS OR SLIP FORMS ARE USED.
- ⑤ POLYETHYLENE (6 MILS THICK) BOND BREAKER.
- ⑥ PAVEMENT SHALL BE DRILLED AND BARS GROUDED.
- ⑦ BARS SHALL BE EITHER DRILLED AND GROUDED OR DRIVEN.
- ⑧ 3" RACEWAY (TYPICAL) SEE ELSEWHERE IN THE PLANS FOR LOCATION AND PAYMENT FOR RACEWAY WHEN REQUIRED.



EXPANSION JOINT DETAIL

APPROXIMATE QUANTITIES PER LINEAR FOOT

TYPE	CONC. - CU.YD.			STEEL - POUNDS		
	(W)			9"	12"	14"
A	0.18	0.20	0.21	▲ 1.34	▲ 1.34	▲ 1.34
B	0.13	0.15	0.16	1.34	1.34	1.34
C	0.18	0.20	0.21	▲ 1.34	▲ 1.34	▲ 1.34
D	0.14	0.16	0.17	0.67	0.67	0.67
E	0.14	0.16	0.17	1.34	1.34	1.34

▲ WHEN REQUIRED

CONCRETE QUANTITIES SHOWN INCLUDE 8" BASE THICKNESS FOR TYPE A, BUT DO NOT INCLUDE QUANTITIES NECESSARY FOR ASPHALT OVERLAY THICKNESS SHOWN FOR TYPE D AND E.

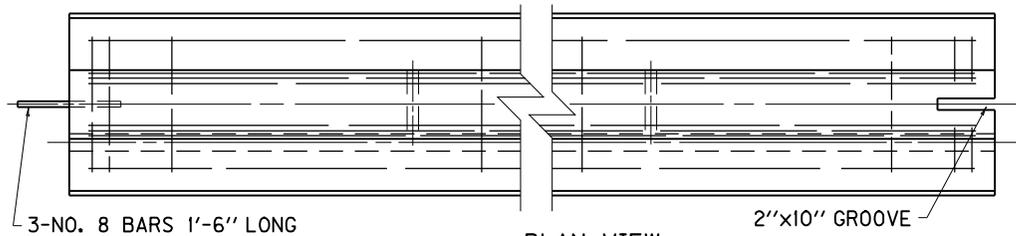
KENTUCKY
DEPARTMENT OF HIGHWAYS

**CONCRETE MEDIAN BARRIER
FIXED-FORM OR SLIP-FORM
(PERMANENT)**

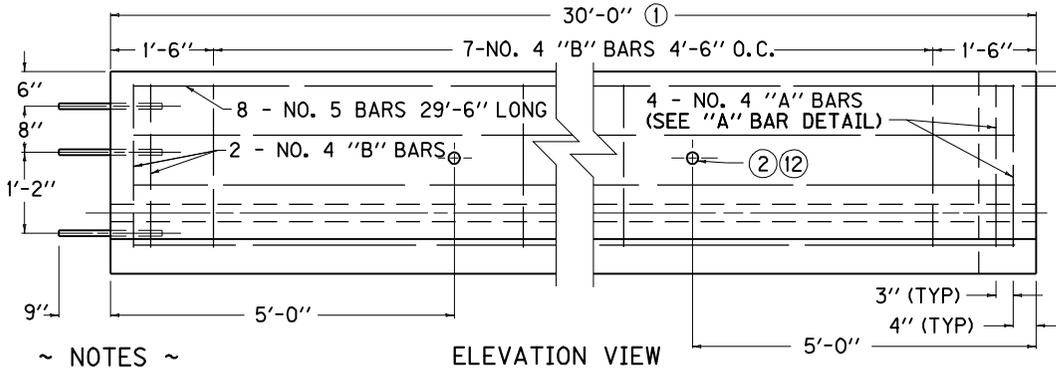
STANDARD DRAWING NO. RBM-001-09

SUBMITTED: *Alan W. Sharp* 12-2-02
DIRECTOR DIVISION OF DESIGN DATE

APPROVED: *J. M. Howell* 12-2-02
STATE HIGHWAY ENGINEER DATE



PLAN VIEW



ELEVATION VIEW

~ NOTES ~

BID ITEM AND UNIT TO BID:

A. CONCRETE MEDIAN BARRIER TYPE \oplus \oplus .

\oplus 9 OR 12 OR 14 DEPENDING ON W.

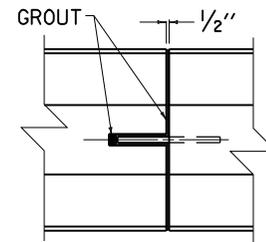
\oplus A OR C DEPENDING ON PAVEMENT TYPE (SEE CUR. STD. DWG. RBM-001 FOR TYPE).

B. WITH FLEXIBLE PAVEMENT THE CONTRACT UNIT PRICE PER LINEAR FOOT SHALL INCLUDE THE BASE, ALL CONCRETE, LABOR, REINFORCING STEEL AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE PERMANENT INSTALLATION.

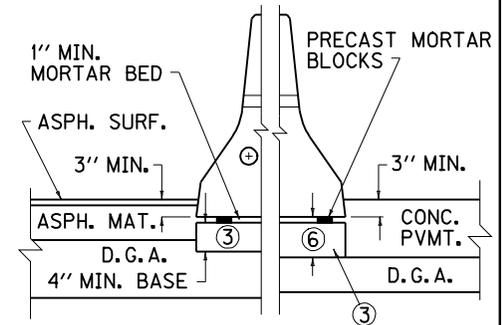
C. WITH RIGID PAVEMENT THE CONTRACT UNIT PRICE PER LINEAR FOOT SHALL INCLUDE, THE BASE, ALL CONCRETE, LABOR, REINFORCING STEEL AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE PERMANENT INSTALLATION.

FOR ILLUSTRATION PURPOSES, THE PAVEMENT DETAIL ABOVE DEPICTS THE INSTALLATION OF A CONCRETE MEDIAN BARRIER (PRECAST) WITH NEW RIGID PAVEMENT ON ONE SIDE AND NEW FLEXIBLE PAVEMENT ON THE OPPOSITE SIDE (SEE PLANS FOR APPLICABLE PAVEMENT DESIGN).

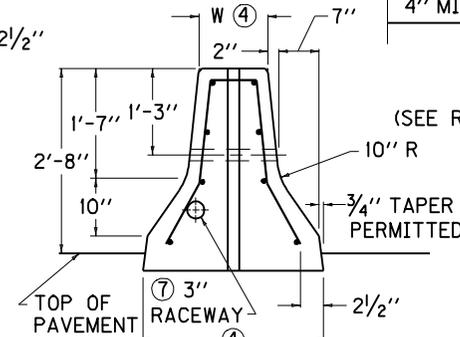
- ① SHORTER SECTIONS MAY BE PERMITTED IF APPROVED IN WRITING BY THE ENGINEER.
- ② 2" DIA. LIFTING HOLE - 2 REQUIRED EACH SECTION. FORMED WITH 2" P.V.C. PIPE OR EQUAL.
- ③ SEE ELSEWHERE IN THE PLANS FOR BASE REQUIREMENTS.
- ④ 9" WIDE TOP WITH 2'-3" WIDE BASE, OR 12" WIDE TOP WITH 2'-6" WIDE BASE OR 14" WIDE TOP 2'-8" WIDE BASE. (TAPER NOT INCLUDED IN BASE WIDTH).
- ⑤ OTHER METHODS OF ANCHORAGE WILL BE ACCEPTABLE IF APPROVED IN WRITING BY THE ENGINEER.
- ⑥ PAVEMENT THICKNESS MINUS 3".
- ⑦ THE RACEWAY SHALL BE TIED TO EACH OF THE "A" AND "B" BARS TO PREVENT SAG. SEE ELSEWHERE IN THE PLANS FOR SIZE, LOCATION, AND PAYMENT FOR RACEWAY WHEN REQUIRED.
8. PLACE ALL STEEL REINFORCEMENT A CLEAR DISTANCE OF 2" MIN. FROM OUTSIDE FACE OF WALL, EXCEPT WHERE SHOWN OTHERWISE.
9. SHOP DRAWINGS SHALL BE APPROVED PRIOR TO MANUFACTURE.
- ⑩ WHEN THE "X" DIMENSION EQUALS 10" THE BAR SHALL BE TURNED DOWN 6" ("Z" DIMENSION) AND AN ADDITIONAL LONGITUDINAL BAR SHALL BE ADDED AT THE BOTTOM OF THE TURN DOWN ("Z" DIMENSION) AND TO THE "Y" PORTION OF THE BAR. FOR EACH 6" INCREMENT OF THE "X" DIMENSION ABOVE 10", AN ADDITIONAL LONGITUDINAL BAR SHALL BE ADDED IN THE "Z" AND "Y" PORTION OF THE BAR.
- ⑪ THE "Z" DIMENSION SHALL INCREASE INCH FOR INCH WHEN THE "X" DIMENSION EXCEEDS 10".
- ⑫ LIFTING BARS SHALL BE REQUIRED TO PREVENT SPALLING OF CONCRETE AROUND HOLES.
13. WHEN THE PRECAST WALL IS USED IN PERMANENT CONSTRUCTION THE LIFTING HOLES SHALL BE FILLED WITH GROUT.



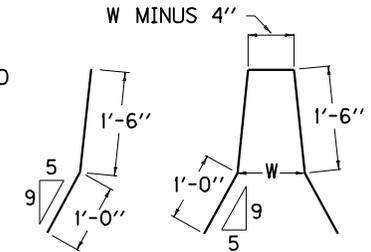
CONNECTION DETAIL



PAVEMENT DETAIL ⑤
(SEE RIGHT ELEVATION FOR DIMENSIONS)

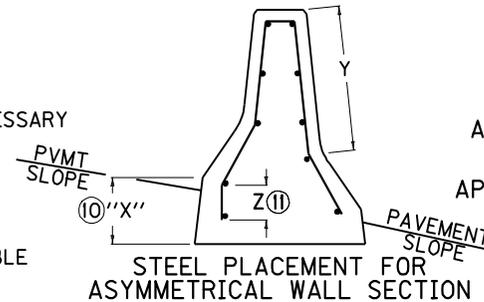


RIGHT ELEVATION VIEW



DETAIL OF "A" BAR

DETAIL OF "B" BAR



APPROX. REINF./30' SECTION
289 LBS.

APPROX. CU. YD. CONC./LIN. FT.

9" WIDE TOP = 0.16

12" WIDE TOP = 0.18

14" WIDE TOP = 0.20

APPROX. WEIGHT/30' SECTION
BASED ON 150 LBS./CU. FT

9" WIDE TOP = 9.8 TONS

12" WIDE TOP = 11.1 TONS

14" WIDE TOP = 12.1 TONS

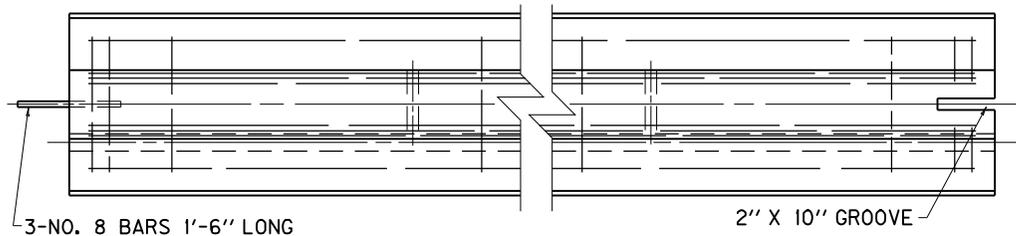
USE WITH CUR. STD. DWG. RBM-001

KENTUCKY
DEPARTMENT OF HIGHWAYS

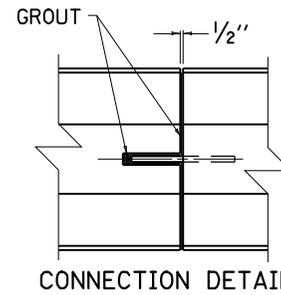
CONCRETE MEDIAN
BARRIER PRECAST
(PERMANENT)

STANDARD DRAWING NO. RBM-003-10

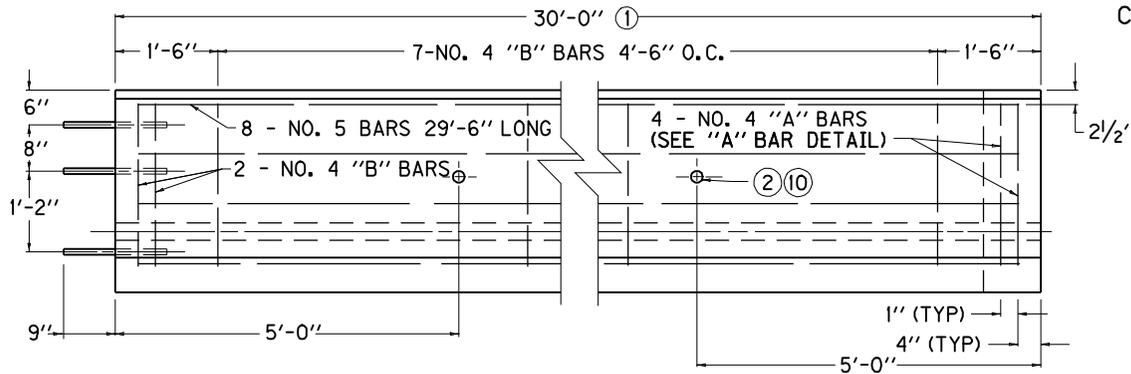
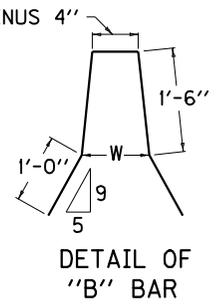
SUBMITTED *Alan W. Sheple* 12-2-02
DIRECTOR DIVISION OF DESIGN DATE
APPROVED *J. M. Powell* 12-2-02
STATE HIGHWAY ENGINEER DATE



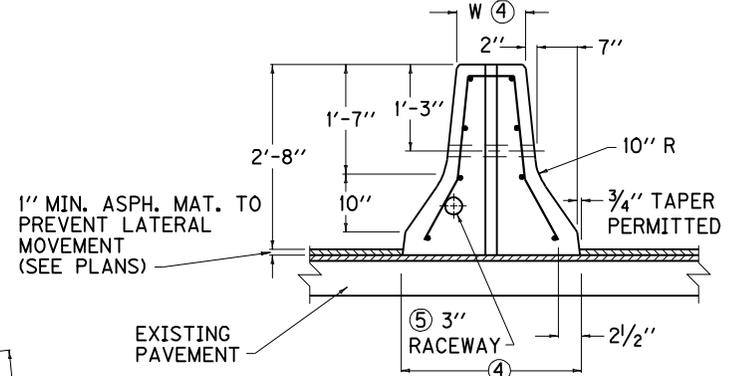
PLAN VIEW



DETAIL OF "A" BAR



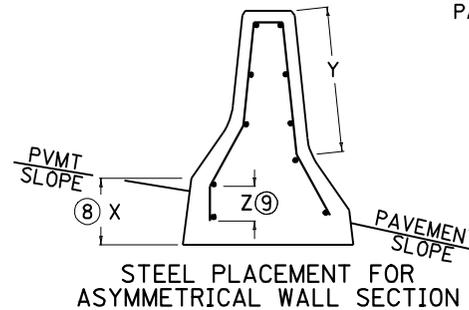
ELEVATION VIEW



APPROX. REINF./30' SECTION
289 LBS.

APPROX. CU. YD. CONC./LIN. FT.
9" WIDE TOP = 0.14
12" WIDE TOP = 0.16
14" WIDE TOP = 0.17

APPROX. WEIGHT/30' SECTION
BASED ON 150 LBS./CU. FT.
9" WIDE TOP = 8.1 TONS
12" WIDE TOP = 9.7 TONS
14" WIDE TOP = 10.6 TONS



~ NOTES ~

BID ITEM AND UNIT TO BID:

A. CONCRETE MEDIAN BARRIER TYPE \oplus \oplus .

\oplus 9 OR 12 OR 14 DEPENDING ON W.

\oplus D OR E DEPENDING ON PAVEMENT TYPE.

- ① SHORTER SECTIONS MAY BE PERMITTED IF APPROVED IN WRITING BY THE ENGINEER.
- ② 2" DIA. LIFTING HOLE - 2 REQUIRED EACH SECTION. FORMED WITH 2" P.V.C. PIPE OR EQUAL.
3. SEE ELSEWHERE IN THE PLANS FOR BASE REQUIREMENTS.
- ④ 9" WIDE TOP WITH 2'-3" WIDE BASE OR 12" WIDE TOP WITH 2'-6" BASE. 14" WIDE TOP WITH 2'-8" WIDE BASE. (TAPER NOT INCLUDED IN BASE WIDTH).
- ⑤ THE RACEWAY SHALL BE TIED TO EACH OF THE A AND B BARS TO PREVENT SAG. SEE ELSEWHERE IN THE PLANS FOR SIZE, LOCATION, AND PAYMENT FOR RACEWAY WHEN REQUIRED.
6. PLACE ALL STEEL REINFORCEMENT A CLEAR DISTANCE OF 2" MIN. FROM OUTSIDE FACE OF WALL, EXCEPT WHERE SHOWN OTHERWISE.
7. SHOP DRAWINGS SHALL BE APPROVED PRIOR TO MANUFACTURE.
- ⑧ WHEN THE "X" DIMENSION EQUALS 10" THE BAR SHALL BE TURNED DOWN 6" ("Z" DIMENSION) AND AN ADDITIONAL LONGITUDINAL BAR SHALL BE ADDED AT THE BOTTOM OF THE TURN DOWN ("Z" DIMENSION) AND TO THE "Y" PORTION OF THE BAR. FOR EACH 6" INCREMENT OF THE "X" DIMENSION ABOVE 10" AN ADDITIONAL LONGITUDINAL BAR SHALL BE ADDED IN THE "Z" AND "Y" PORTION OF THE BAR.
- ⑨ THE "Z" DIMENSION SHALL INCREASE INCH FOR INCH WHEN THE "X" DIMENSION EXCEEDS 10".
- ⑩ LIFTING BARS SHALL BE REQUIRED TO PREVENT SPALLING OF CONCRETE AROUND HOLES.
11. WHEN THE PRECAST WALL IS USED IN PERMANENT CONSTRUCTION THE LIFTING HOLES SHALL BE FILLED WITH GROUT.

USE WITH CUR. STD. DWG. RBM-001

KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE MEDIAN
BARRIER PRECAST
(PERMANENT)

STANDARD DRAWING NO. RBM-006-09

SUBMITTED *Alan W. Shores* 12-2-02
DIRECTOR DIVISION OF DESIGN DATE
APPROVED *J. M. Howell* 12-2-02
STATE HIGHWAY ENGINEER DATE

NOTES

TRANSITION CONDITION NO. 1, 2 AND 3 ALONG WITH SYMMETRICAL AND ASYMMETRICAL BARRIER SECTIONS ARE DEPICTED ON THIS DRAWING FOR ILLUSTRATION PURPOSES ONLY AT STRUCTURES AND FIXED OBJECTS. (SEE PLANS FOR ADDITIONAL DETAILS)

ALL PAVEMENT, FILL MATERIAL, PIPE DRAINAGE (EXCLUSIVE OF WEEP HOLE PIPE) PLACED BETWEEN SEGMENTS OF THE BARRIER SHALL BE SHOWN SEPARATELY OR INCLUDED WITH OTHER LIKE PAY ITEMS ON THE PROJECT.

FOR APPLICATION DETAILS TO NEW OR EXISTING PAVEMENT SEE DRAWING ENTITLED "CONCRETE MEDIAN BARRIER, FIXED FORM OR SLIP FORM (PERMANENT)".

THE METHOD OF MEASUREMENT FOR CONCRETE MEDIAN BARRIER FOR EACH TYPE WILL BE IN LINEAR FEET MEASURED ALONG THE TOP CENTERLINE OF THE BARRIER.

THE SEPARATE OR SOLID BARRIER SHALL BE SHOWN IN THE BID ITEM AS FOLLOWS: "CONCRETE MEDIAN BARRIER ⊕ ⊕ ☆"

⊕ 9, 12, OR 14 DEPENDING ON "W"

⊕ A, B, C, D OR E DEPENDING ON PAVEMENT APPLICATION.

☆ 1 = SOLID SEGMENT- DENOTES BARRIER WALL WITH:

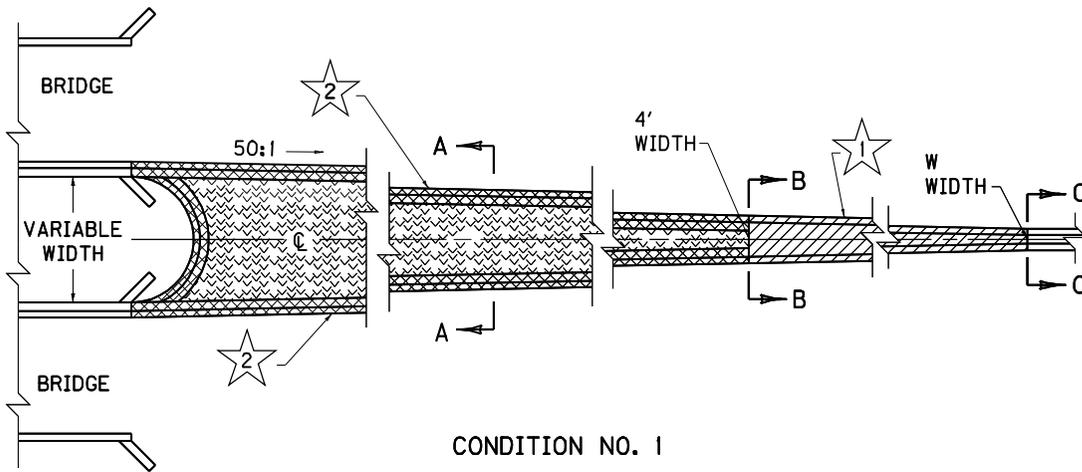
a. TRANSITION FROM "W" WIDTH TO MAX. WIDTH OF 4'.

b. CONSTANT WIDTH WALL GREATER THAN "W" WIDE BUT NOT GREATER THAN 4' WIDE. (EX.: WALL BETWEEN BRDG. PIERS).

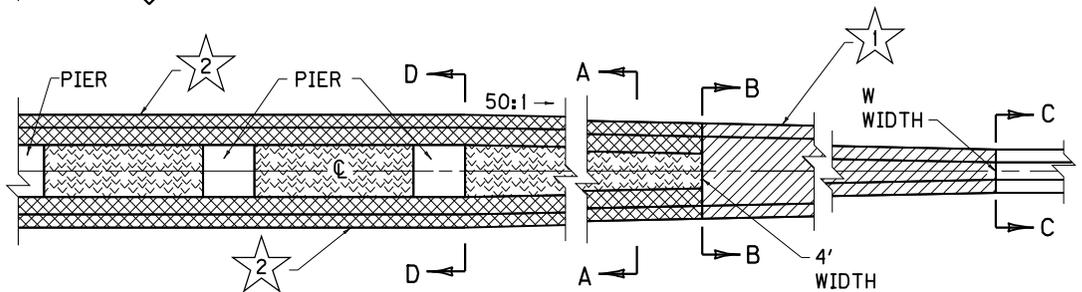
2 = SEPARATE SEGMENT

③ SEE ELSEWHERE IN PLANS FOR SIZE, LOCATION AND PAYMENT FOR RACEWAY WHEN REQUIRED.

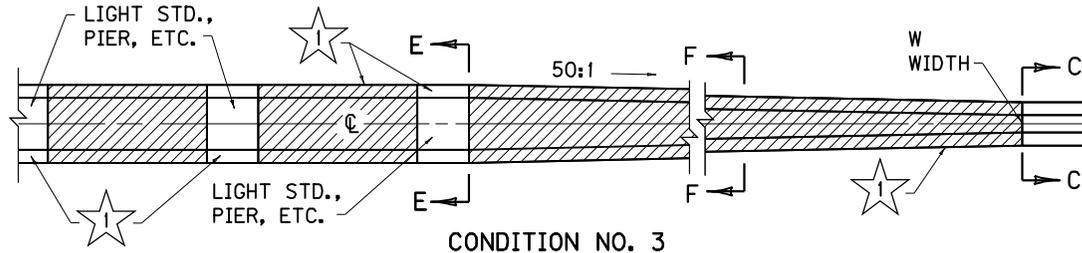
④ 4" PIPE FOR WEEP HOLES SPACED ON 20' CENTERS AND STAGGERED 10' WITH EACH WALL.



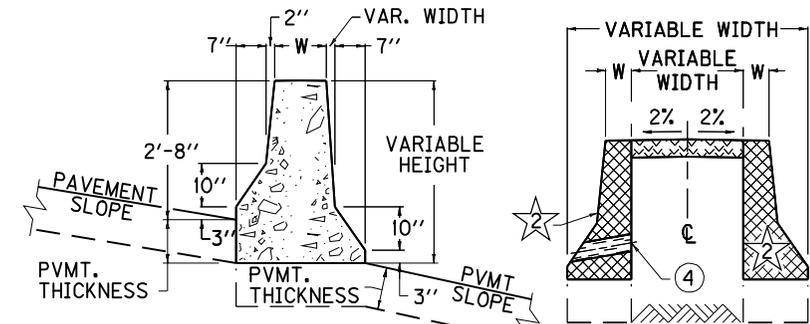
CONDITION NO. 1



CONDITION NO. 2

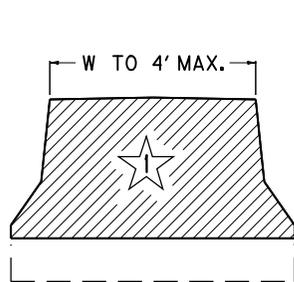


CONDITION NO. 3

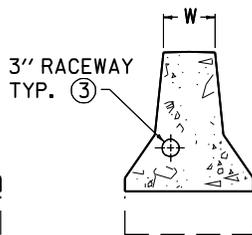


ASYMMETRICAL WALL SECTION

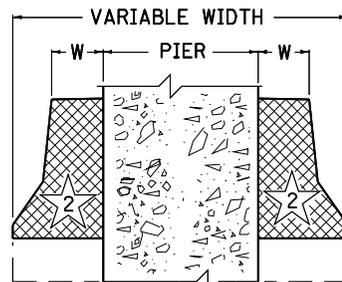
SECTION A-A



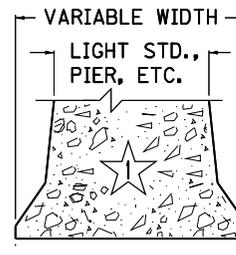
SECTION B-B



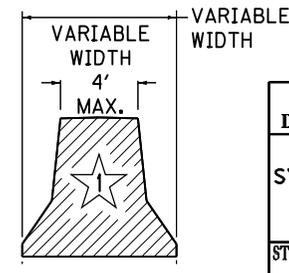
NORMAL SECTION C-C



SECTION D-D



SECTION E-E



SECTION F-F

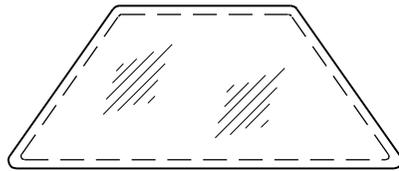
KENTUCKY
DEPARTMENT OF HIGHWAYS
CONCRETE MEDIAN BARRIER
SYMMETRICAL & ASYMMETRICAL
SEPARATE & TRANSITION
DETAILS

STANDARD DRAWING NO. RBM-015-05

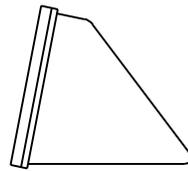
SUBMITTED: *[Signature]* 12-2-02
DIRECTOR DIVISION OF DESIGN DATE
APPROVED: *[Signature]* 12-2-02
STATE HIGHWAY ENGINEER DATE

NOTES

1. DELINEATORS SHALL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR ONE COMPLETE INSTALLATION.
2. CODE PAY ITEM PAY UNIT
 1984 DELINEATOR FOR BARRIER-WHITE EACH
 1985 DELINEATOR FOR BARRIER-YELLOW EACH
3. THE DELINEATORS SHALL BE YELLOW IN COLOR WHEN THE BARRIER IS PLACED IN THE MEDIAN AND/OR ON THE LEFT SIDE OF THE DRIVING LANE. THE DELINEATORS SHALL BE WHITE IN COLOR WHEN THE BARRIER IS PLACED ON THE RIGHT SIDE OF THE DRIVING LANE.
4. TYPES OF DELINEATORS PERMITTED SHALL BE FROM THE APPROVED MATERIALS LIST. THE DELINEATOR'S SHAPES SHOWN ARE FOR ILLUSTRATION PURPOSES.
5. THE DELINEATOR UNIT SHALL HAVE THE REFLECTIVE SURFACE INSTALLED FACING TRAFFIC.
6. CLEAN THE AREA TO RECEIVE THE REFLECTOR WITH A STEEL WIRE BRUSH TO REMOVE ALL LOOSE CONCRETE AND/OR DIRT.
7. DELINEATORS SHALL BE ATTACHED TO CONCRETE MEDIAN BARRIER WITH AN EPOXY ADHESIVE OR OTHER APPROVED MATERIALS.
8. THE DELINEATOR TYPE A SHALL NOT BE PLACED ON TOP OF BARRIER WALL.
9. THESE DELINEATORS MAY BE "TYPE A" OR "TYPE B MODEL ONE".



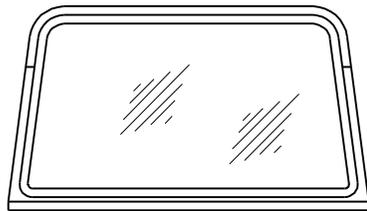
FRONT ELEVATION



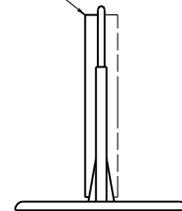
SIDE ELEVATION

"TYPE A"

"MODEL ONE" (REFLECTOR ONE SIDE)
 OR
 "MODEL TWO" (REFLECTOR TWO SIDES)



FRONT ELEVATION

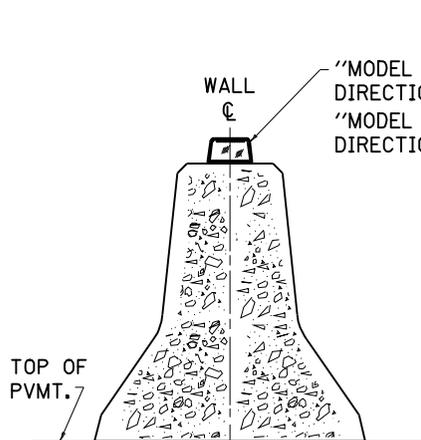


SIDE ELEVATION

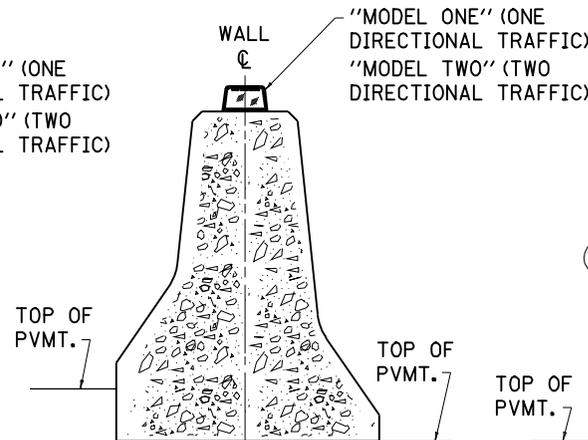
"TYPE B"

DELINEATOR SPACINGS ON HORIZONTAL CURVES	
DEGREE OF CURVE	SPACING ON CURVES
$\leq 2^\circ$	100'
$> 2^\circ \leq 4^\circ$	75'
$> 4^\circ$	50'

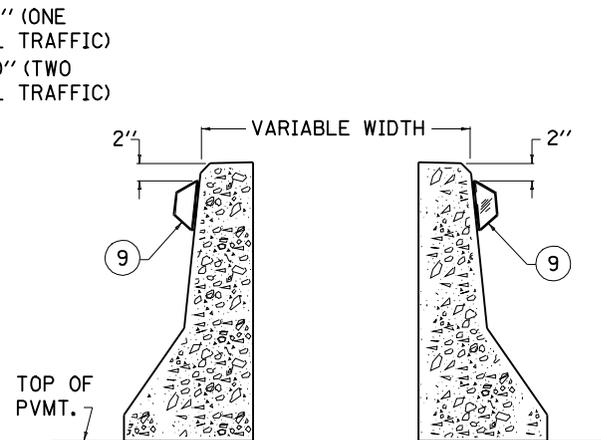
SPACING ON TANGENTS = 100' INTERVALS



NORMAL (SOLID) WALL SECTION



ASYMMETRICAL (SOLID) WALL SECTION



(SEPARATE SEGMENT) WALL SECTION

KENTUCKY
 DEPARTMENT OF HIGHWAYS

DELINEATORS FOR
 CONCRETE BARRIERS

STANDARD DRAWING NO. RBM-020-08

SUBMITTED *John B. Anshutz* 12-1-99
 DIRECTOR DIVISION OF DESIGN DATE

APPROVED *J. M. Howell* 12-1-99
 STATE HIGHWAY ENGINEER DATE

NOTES

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

MODULAR GLARE SCREEN \triangle - \circ SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER LINEAR FOOT AND SHALL INCLUDE ALL LABOR, MATERIALS AND OTHER INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION .

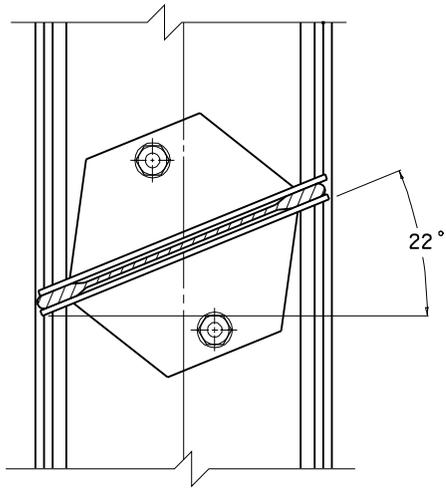
- \triangle 18" , 24" , OR 30"
- \circ (W) = WHITE OR (G) = GREEN

CONSTRUCTION METHODS

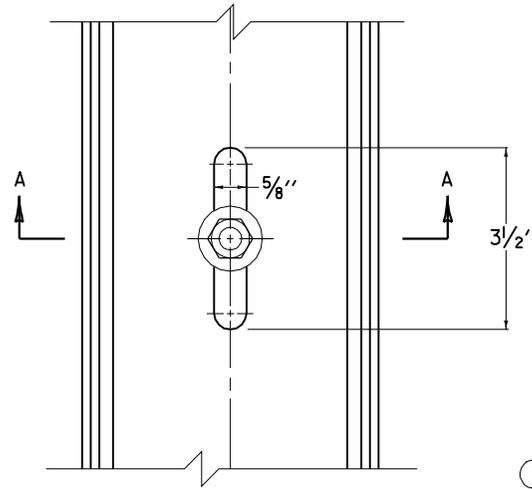
INSTALLATION SHALL BE COMPLETED IN ACCORDANCE WITH THE MANUFACTURES RECOMMENDATIONS (A COPY OF WHICH SHALL BE FURNISHED TO THE ENGINEER) .

MODULAR UNITS ARE FURNISHED IN LENGTHS OF 10' (8 BLADES) OR 12' (10 BLADES). THE DISTANCE BETWEEN EACH UNIT SHALL BE 1" WHEN INSTALLED.

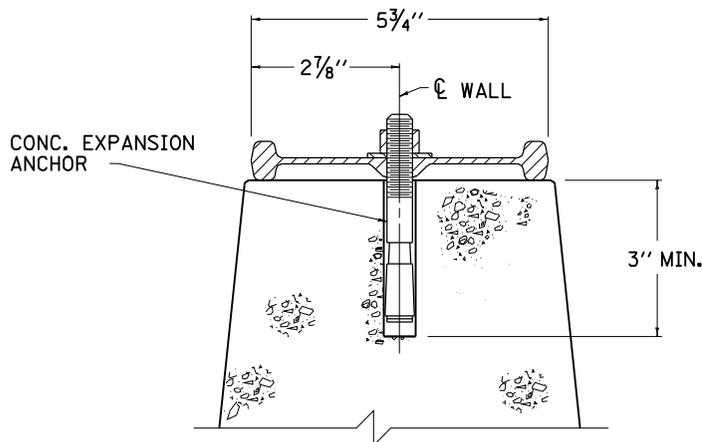
- ① 3" X 6" STRIP OF REFLECTIVE MATERIAL CENTERED VERTICAL AND OFFSET HORIZONTAL TOWARD THE DRIVING LANE EDGE. PLACE ONE 3" X 6" STRIP EVERY 10'-0" ON CENTER.



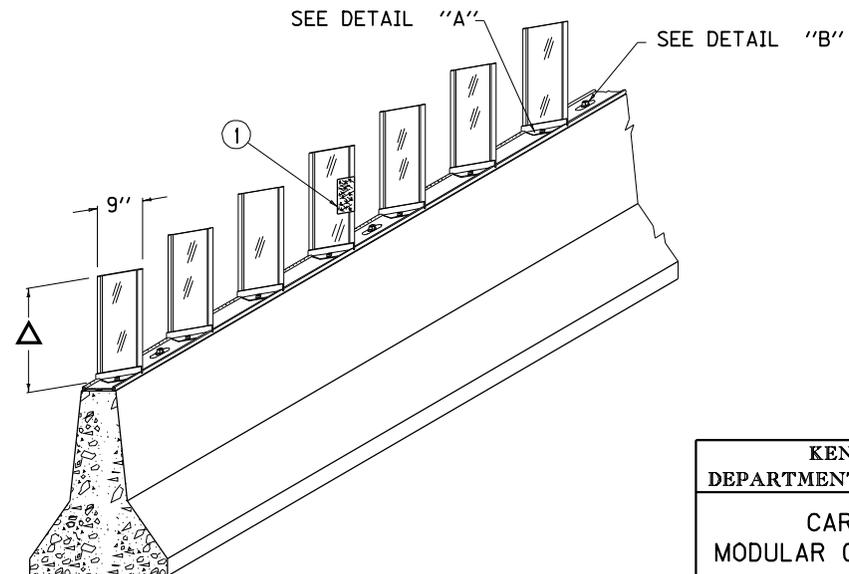
DETAIL "A"
(BLADE MOUNTING)



DETAIL "B"
(RAIL MOUNTING)



SECTION A-A



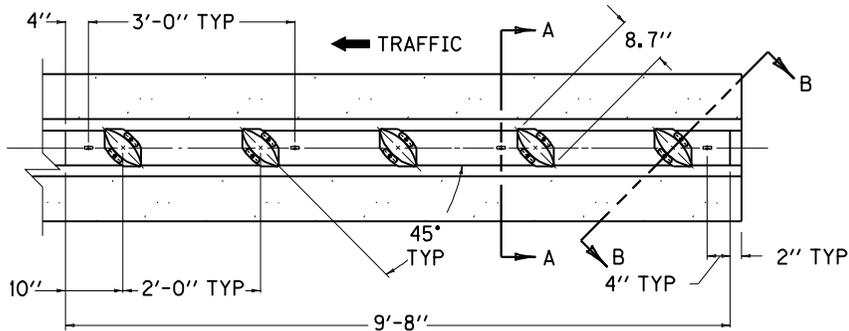
PICTORIAL VIEW

KENTUCKY
DEPARTMENT OF HIGHWAYS

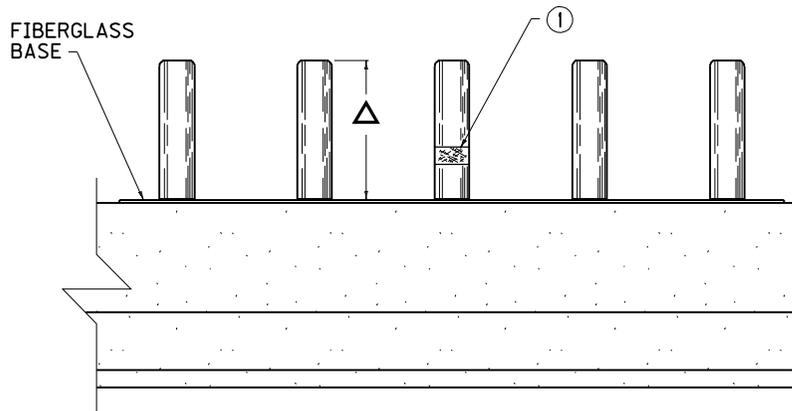
CARSONITE
MODULAR GLARE SCREEN
(FOR CONC. MEDIAN BARRIERS)

STANDARD DRAWING NO. RBM-025-02

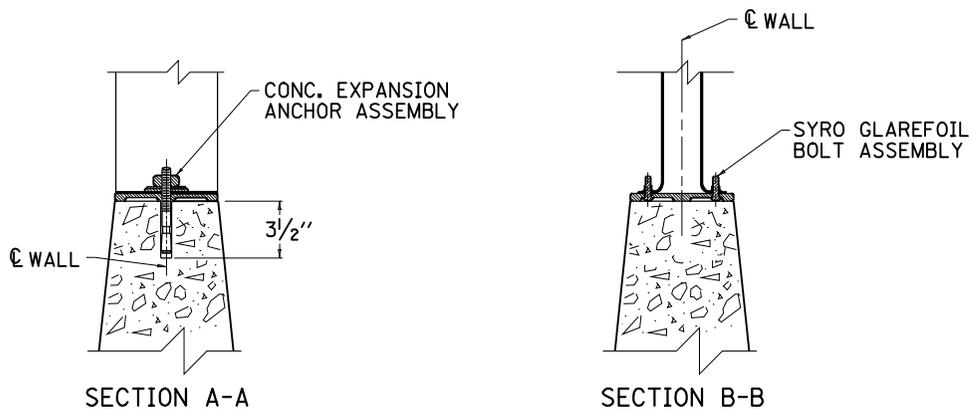
SUBMITTED *John B. Anhalt* 12-1-99
DIRECTOR DIVISION OF DESIGN DATE
APPROVED *J. M. Howell* 12-1-99
STATE HIGHWAY ENGINEER DATE



TOP ELEVATION



SIDE ELEVATION



NOTES

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

MODULAR GLARE SCREEN \triangle - \square SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER LINEAR FOOT AND SHALL INCLUDE ALL LABOR, MATERIALS AND OTHER INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION .

\triangle 24" , 36" , OR 48" (HEIGHT)

\square (G) = GREEN

CONSTRUCTION METHODS

INSTALLATION SHALL BE COMPLETED IN ACCORDANCE WITH THE MANUFACTURES RECOMMENDATIONS (A COPY OF WHICH SHALL BE FURNISHED TO THE ENGINEER) .

- ① 3" WIDE STRIP OF REFLECTIVE MATERIAL AROUND BLADE EVERY 10'-0" ON CENTER.
2. MODULAR UNITS ARE FURNISHED IN LENGTHS OF 9'-8". THE DISTANCE BETWEEN EACH UNIT SHALL BE 4" WHEN INSTALLED.

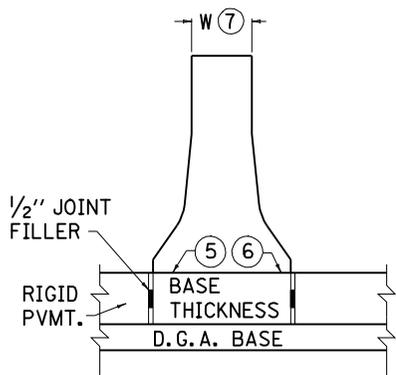
KENTUCKY
DEPARTMENT OF HIGHWAYS

SYRO STEEL
MODULAR GLARE SCREEN
(FOR CONC. MEDIAN BARRIERS)

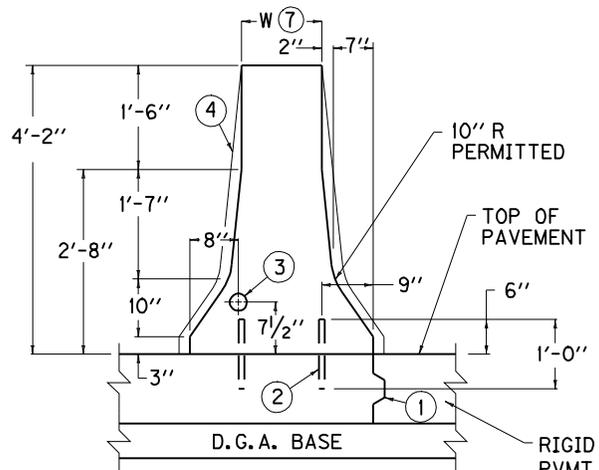
STANDARD DRAWING NO. RBM-030-03

SUBMITTED *John B. Anhalt* 12-1-99
DIRECTOR DIVISION OF DESIGN DATE

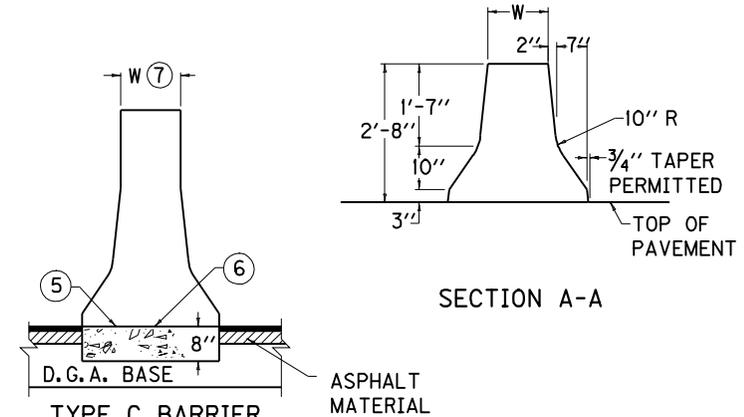
APPROVED *J. M. Howell* 12-1-99
STATE HIGHWAY ENGINEER DATE



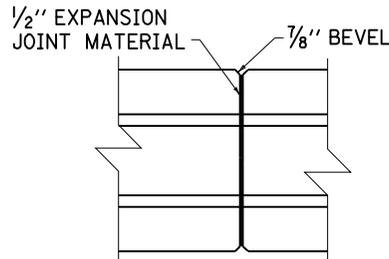
TYPE A BARRIER
(NEW RIGID PAVEMENT)



TYPE B BARRIER
(NEW RIGID PAVEMENT)



TYPE C BARRIER
(NEW FLEXIBLE PAVEMENT)



EXPANSION JOINT DETAIL

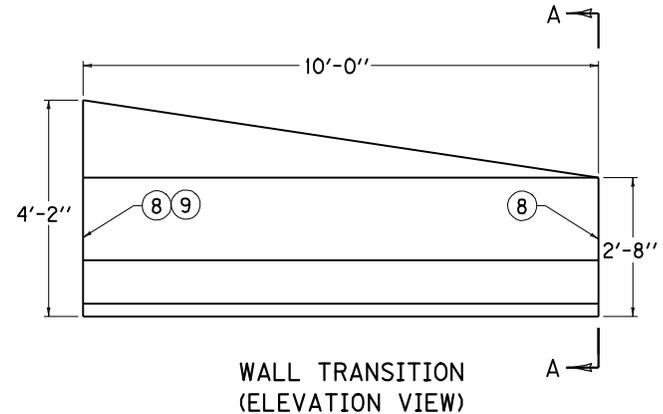
~ NOTES ~

THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR "CONCRETE MEDIAN BARRIER TYPE ★ ⊕ 50" SHALL BE FULL COMPENSATION FOR ALL MATERIALS, EQUIPMENT, LABOR AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.

★ 12 OR 14 DEPENDING ON W.

⊕ A, B OR C DEPENDING ON PAVEMENT TYPE.

- ① LONGITUDINAL CONSTRUCTION JOINT WITHOUT TIE BARS IS REQUIRED AND SHALL BE PLACED AT THE LOCATION SHOWN OR MAY BE INSTALLED AT THE CORRESPONDING POINT ON THE OPPOSITE SIDE OF THE BARRIER, AT THE OPTION OF THE CONTRACTOR. IT SHALL BE REQUIRED ON THE LOW SIDE OF A SUPERELEVATED SECTION.
- ② NO. 8 DOWEL BARS SPACED 4'-0" O.C. AND STAGGERED 2'-0".
- ③ 3" RACEWAY (TYPICAL) SEE ELSEWHERE IN THE PLANS FOR LOCATION AND PAYMENT FOR RACEWAY WHEN REQUIRED.
- ④ WALL MAY BE FORMED AS DEPICTED BY PHANTOM LINES.
- ⑤ WHEN A CONSTRUCTION JOINT IS USED, DOWEL BARS WILL BE REQUIRED AS SHOWN WITH TYPE B BARRIERS.
- ⑥ CONSTRUCTION JOINT PERMITTED WHEN FIXED FORMS OR SLIP FORMS ARE USED.
- ⑦ A 14" WALL IS REQUIRED ONLY WHEN THE ROADWAY WILL BE LIGHTED FROM THE MEDIAN.
- ⑧ THE WALL TRANSITION DETAILED IS FOR A FIXED-FORM OR SLIP-FORM WALL. SEE CURRENT STANDARD DRAWING RBM-053 FOR CONNECTION DETAILS, STEEL PLACEMENT,
- ⑨ SEE TYPE B BARRIER DETAIL FOR WALL DIMENSIONS.



WALL TRANSITION
(ELEVATION VIEW)

APPROX. QUANTITIES PER LINEAR FOOT

TYPE	12" WALL		14" WALL	
	CONC. IN CU. YDS.	STEEL IN POUNDS	CONC. IN CU. YDS.	STEEL IN POUNDS
A	0.27	Δ 1.34	0.30	Δ 1.34
B	0.21	1.34	0.23	1.34
C	0.27	Δ 1.34	0.30	Δ 1.34

Δ WHEN REQUIRED

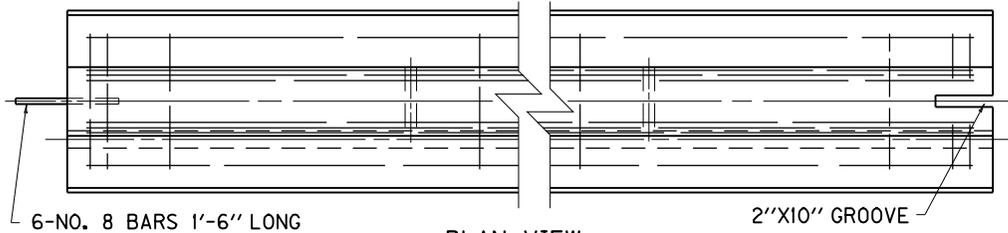
CONCRETE QUANTITIES SHOWN INCLUDE 8" BASE THICKNESS FOR TYPE A AND TYPE C.

USE WITH CUR. STD. DWG.
RBM-053

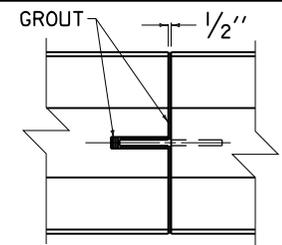
KENTUCKY
DEPARTMENT OF HIGHWAYS
CONCRETE MEDIAN BARRIER
FIXED-FORM OR SLIP-FORM
(PERMANENT)
(50" TALL WALL)

STANDARD DRAWING NO. RBM-050

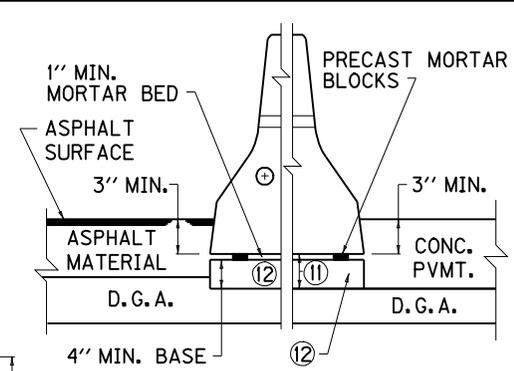
SUBMITTED: *[Signature]* 12-2-02
DIRECTOR DIVISION OF DESIGN DATE
APPROVED: *[Signature]* 12-2-02
STATE HIGHWAY ENGINEER DATE



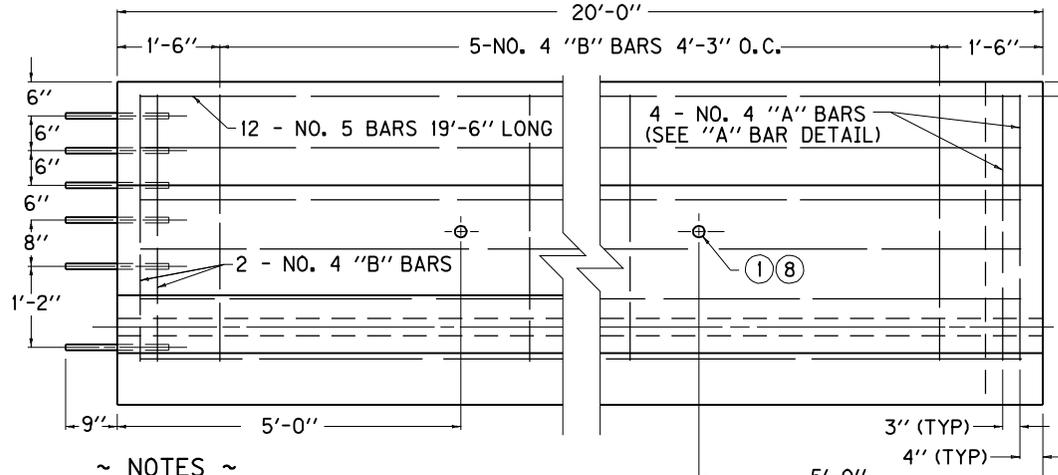
PLAN VIEW



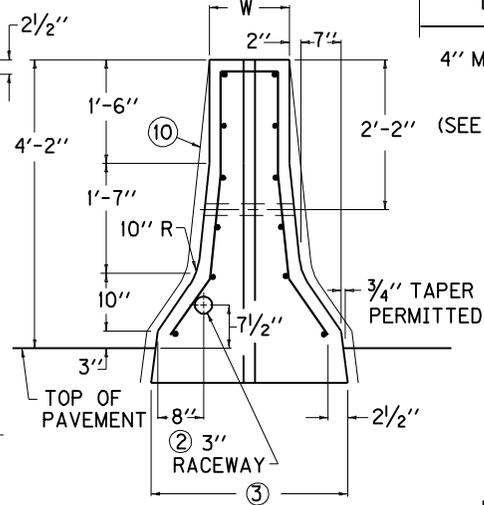
CONNECTION DETAIL



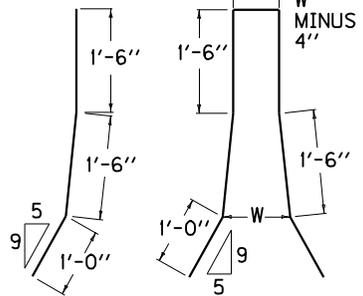
PAVEMENT DETAIL
(SEE RIGHT ELEVATION FOR DIMENSIONS)



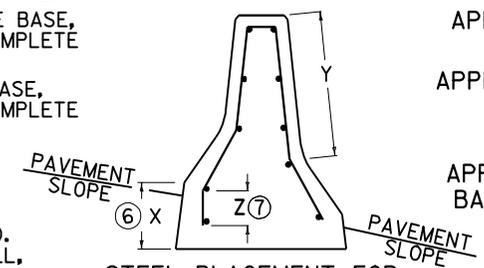
ELEVATION VIEW



RIGHT ELEVATION VIEW



DETAIL OF "A" BAR
DETAIL OF "B" BAR



STEEL PLACEMENT FOR ASYMMETRICAL WALL SECTION

~ NOTES ~

- BID ITEM AND UNIT TO BID: **★** \oplus 50.
- ★** 12 OR 14 DEPENDING ON W.
- \oplus A OR C DEPENDING ON PAVEMENT TYPE. SEE CURRENT STANDARD DRAWING FOR PAVEMENT TYPE.
- B. WITH FLEXIBLE PAVEMENT THE CONTRACT UNIT PRICE PER LINEAR FOOT SHALL INCLUDE THE BASE, ALL CONCRETE, LABOR, REINFORCING STEEL AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE PERMANENT INSTALLATION.
- C. WITH RIGID PAVEMENT THE CONTRACT UNIT PRICE PER LINEAR FOOT SHALL INCLUDE, THE BASE, ALL CONCRETE, LABOR, REINFORCING STEEL AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE PERMANENT INSTALLATION.
- ① 2" DIA. LIFTING HOLE - 2 REQUIRED EACH SECTION. FORMED WITH 2" P.V.C. PIPE OR EQUAL.
 - ② THE RACEWAY SHALL BE TIED TO EACH OF THE A AND B BARS TO PREVENT SAG. SEE ELSEWHERE IN THE PLANS FOR LOCATION AND PAYMENT FOR RACEWAY WHEN REQUIRED.
 - ③ 12" W WITH 2'-6" WIDE BASE OR 14" W WITH 2'-8" BASE (TAPER NOT INCLUDED IN BASE WIDTH).
 4. PLACE ALL STEEL REINFORCEMENT A CLEAR DISTANCE OF 2" MIN. FROM OUTSIDE FACE OF WALL, EXCEPT WHERE SHOWN OTHERWISE.
 5. SHOP DRAWINGS SHALL BE APPROVED PRIOR TO MANUFACTURE.
 - ⑥ WHEN THE "X" DIMENSION EQUALS 10" THE BAR SHALL BE TURNED DOWN 6" ("Z" DIMENSION) AND AN ADDITIONAL LONGITUDINAL BAR SHALL BE ADDED AT THE BOTTOM OF THE TURN DOWN ("Z" DIMENSION) AND TO THE "Y" PORTION OF THE BAR. FOR EACH 6" INCREMENT OF THE "X" DIMENSION ABOVE 10" AN ADDITIONAL LONGITUDINAL BAR SHALL BE ADDED IN THE "Z" AND "Y" PORTION OF THE BAR.
 - ⑦ THE "Z" DIMENSION SHALL INCREASE INCH FOR INCH WHEN THE "X" DIMENSION EXCEEDS 10".
 - ⑧ LIFTING BARS SHALL BE REQUIRED TO PREVENT SPALLING OF CONCRETE AROUND HOLES.
 - ⑨ THE LIFTING HOLES SHALL BE FILLED WITH GROUT WHEN COMPLETE.
 - ⑩ WALL MAY BE FORMED AS DEPICTED BY PHANTOM LINES.
 - ⑪ PAVEMENT THICKNESS MINUS 3".
 - ⑫ SEE ELSEWHERE IN PLANS FOR BASE REQUIREMENTS.
 13. SEE CURRENT STANDARD DRAWING **RBM-050** FOR WALL TRANSITION WHEN APPLICABLE.

APPROX. REINF./20' SECTION
296 LBS.

APPROX. CU. YD. CONC./LIN. FT.
12" WIDE TOP = 0.23
14" WIDE TOP = 0.26

APPROX. WEIGHT/20' SECTION
BASED ON 150 LBS./CU. FT.
12" WIDE TOP = 9.3 TONS
14" WIDE TOP = 10.4 TONS

USE WITH CUR. STD. DWG.
RBM-050

KENTUCKY DEPARTMENT OF HIGHWAYS	
CONCRETE MEDIAN BARRIER PRECAST (PERMANENT) (50" TALL WALL)	
STANDARD DRAWING NO. RBM-053	
SUBMITTED: <i>[Signature]</i> <small>DIRECTOR DIVISION OF DESIGN</small>	12-2-02 <small>DATE</small>
APPROVED: <i>[Signature]</i> <small>STATE HIGHWAY ENGINEER</small>	12-2-02 <small>DATE</small>

NOTES

TRANSITION CONDITION NO. 1, 2 AND 3 ALONG WITH SYMMETRICAL AND ASYMMETRICAL BARRIER SECTIONS ARE DEPICTED ON THIS DRAWING FOR ILLUSTRATION PURPOSES ONLY AT STRUCTURES AND FIXED OBJECTS. (SEE PLANS FOR ADDITIONAL DETAILS)

ALL PAVEMENT, FILL MATERIAL, PIPE DRAINAGE (EXCLUSIVE OF WEEP HOLE PIPE) PLACED BETWEEN SEGMENTS OF THE BARRIER SHALL BE SHOWN SEPARATELY OR INCLUDED WITH OTHER LIKE PAY ITEMS ON THE PROJECT.

FOR APPLICATION DETAILS SEE DRAWING ENTITLED "CONCRETE MEDIAN BARRIER, FIXED FORM OR SLIP FORM (PERMANENT) (50" TALL WALL)". THE METHOD OF MEASUREMENT FOR CONCRETE MEDIAN BARRIER FOR EACH TYPE WILL BE IN LINEAR FEET MEASURED ALONG THE TOP CENTERLINE OF THE BARRIER.

THE SEPARATE OR SOLID BARRIER SHALL BE SHOWN IN THE BID ITEM AS FOLLOWS: "CONCRETE MEDIAN BARRIER TYPE ⊕ ⊕ ☆ (50)"

⊕ 12, OR 14 DEPENDING ON "W"

⊕ A, B OR C DEPENDING ON PAVEMENT APPLICATION.

☆ 1 = SOLID SEGMENT - DENOTES BARRIER WALL WITH:

a. TRANSITION FROM "W" WIDTH TO MAX. WIDTH OF 4'.

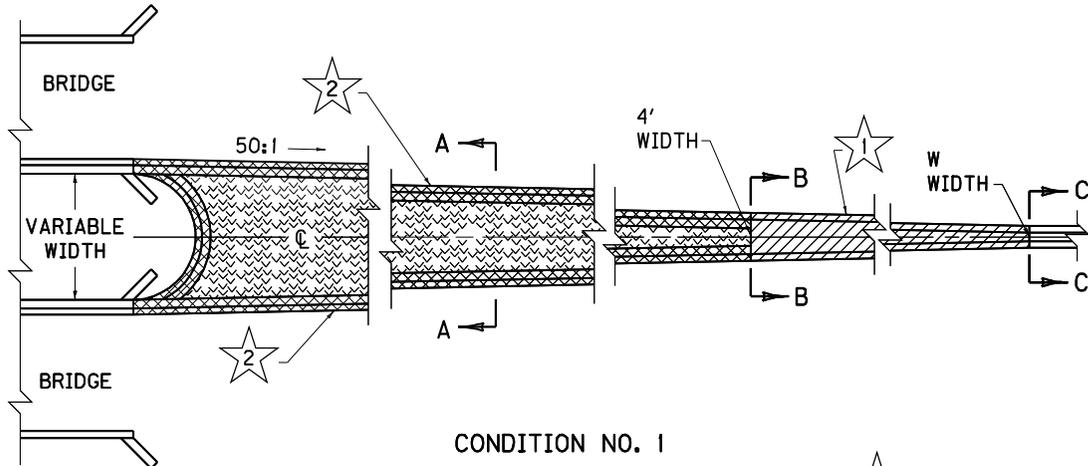
b. CONSTANT WIDTH WALL GREATER THAN "W" WIDE BUT NOT GREATER THAN 4' WIDE. (EX.: WALL BETWEEN BRDG. PIERS).

2 = SEPARATE SEGMENT

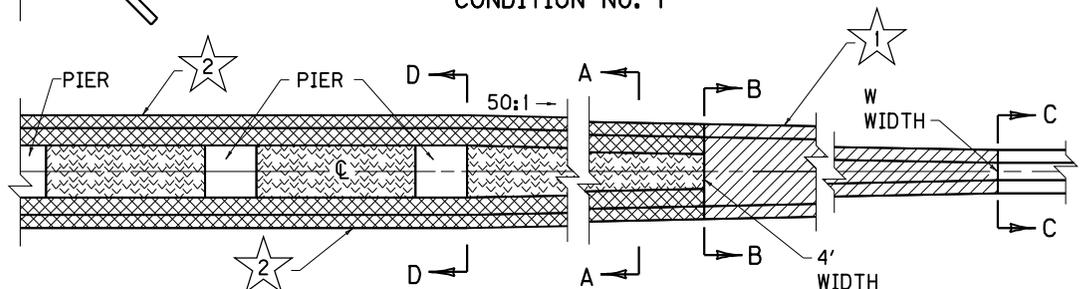
③ SEE ELSEWHERE IN PLANS FOR SIZE, LOCATION AND PAYMENT FOR RACEWAY WHEN REQUIRED.

④ 4" PIPE FOR WEEP HOLES SPACED ON 20' CENTERS AND STAGGERED 10' WITH EACH WALL.

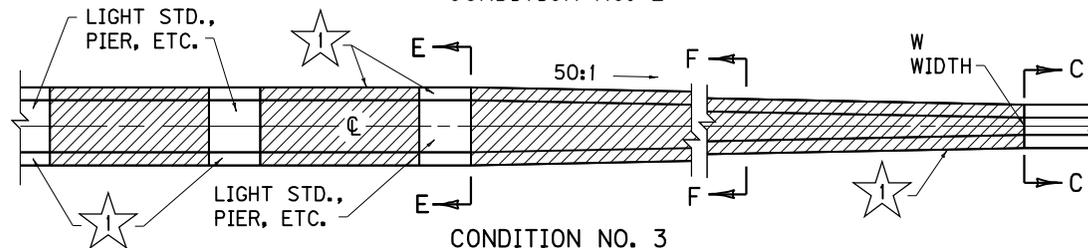
⑤ VARIABLE WIDTH



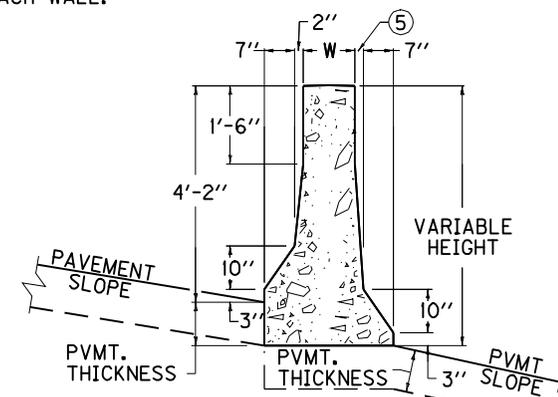
CONDITION NO. 1



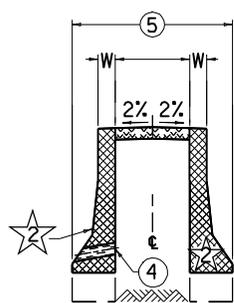
CONDITION NO. 2



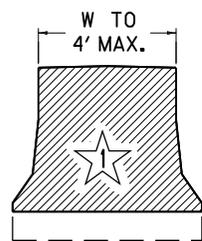
CONDITION NO. 3



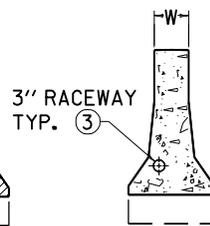
ASYMMETRICAL WALL SECTION



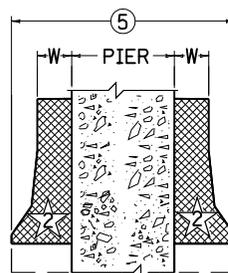
SECTION A-A



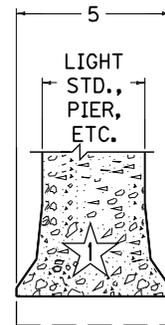
SECTION B-B



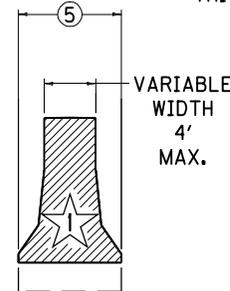
NORMAL SECTION C-C



SECTION D-D



SECTION E-E



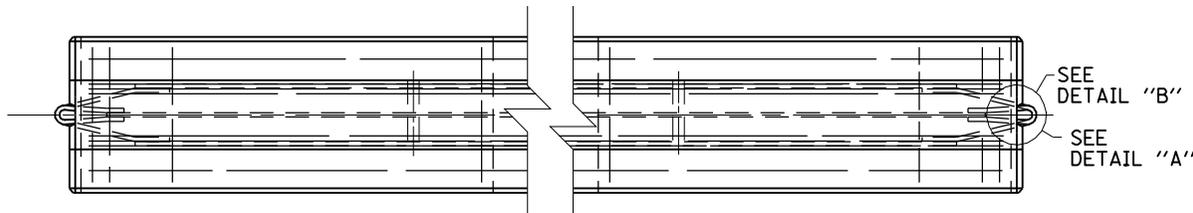
SECTION F-F

KENTUCKY
DEPARTMENT OF HIGHWAYS

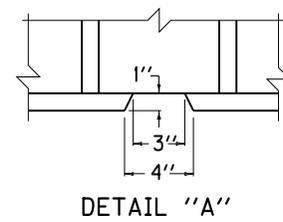
CONCRETE MEDIAN BARRIER
SYMMETRICAL & ASYMMETRICAL
SEPARATE & TRANSITION
DETAILS (50" TALL WALL)

STANDARD DRAWING NO. RBM-060

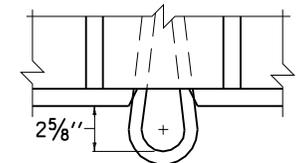
SUBMITTED: *John W. Shaper* 12-2-02
DIRECTOR DIVISION OF DESIGN DATE
APPROVED: *J. M. Powell* 12-2-02
STATE HIGHWAY ENGINEER DATE



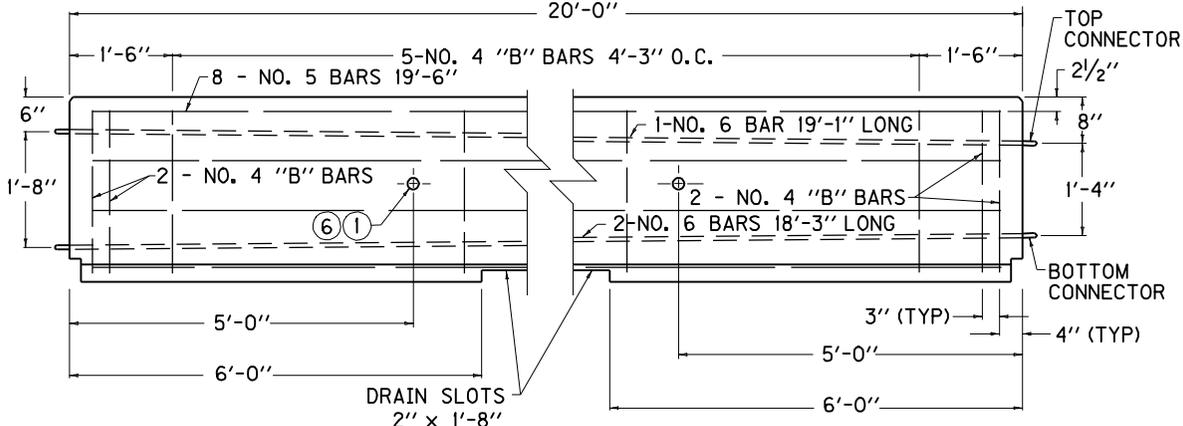
PLAN VIEW



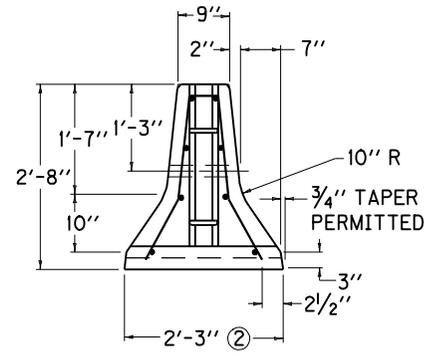
DETAIL "A"



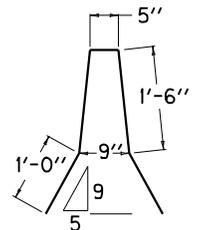
DETAIL "B"



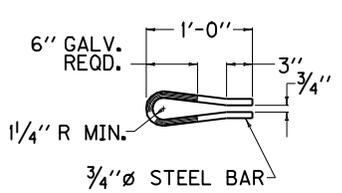
ELEVATION VIEW



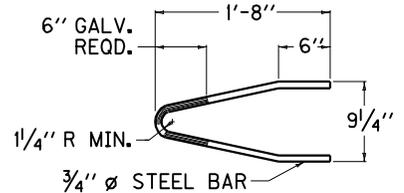
RIGHT ELEVATION VIEW



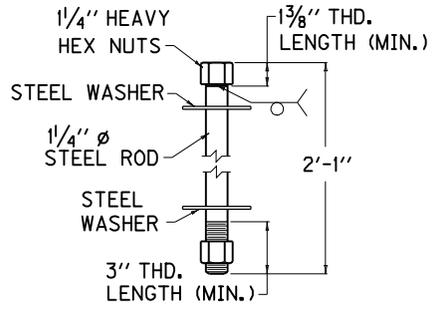
DETAIL OF "B" BAR



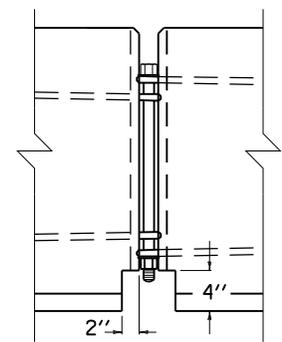
- TOP CONNECTOR -
(HOT DIP GALVANIZE AFTER FORMING)



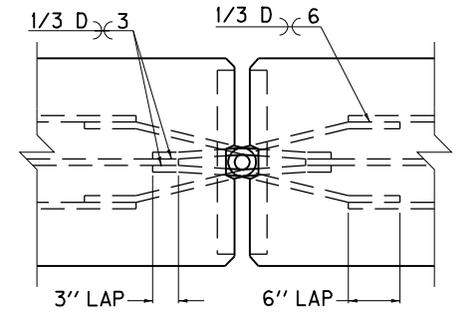
- BOTTOM CONNECTOR -
(HOT DIP GALVANIZE AFTER FORMING)



- CONNECTOR PIN -



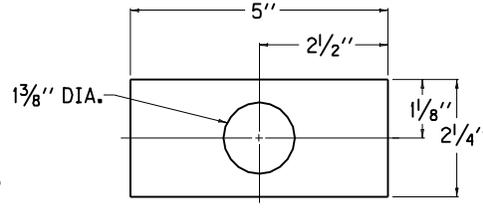
- ELEVATION OF CONNECTION DETAIL -



- PLAN OF CONNECTION DETAIL -

~ NOTES ~

- BID ITEM AND UNIT TO BID:
CONC. BARRIER WALL TYPE 9T - LIN. FT.
- ① 2" DIA. LIFTING HOLE - 2 REQUIRED EACH SECTION. FORMED WITH 2" P.V.C. PIPE OR EQUAL.
- ② TAPER NOT INCLUDED IN BASE WIDTH.
- ③ SHOP DRAWINGS SHALL BE APPROVED PRIOR TO MANUFACTURE.
- ④ BASED ON 150 LBS./CU. FT.
- ⑤ PLACE ALL STEEL REINFORCEMENT A CLEAR DISTANCE OF 2" MIN. FROM OUTSIDE FACE OF WALL, EXCEPT WHERE SHOWN OTHERWISE.
- ⑥ LIFTING BARS SHALL BE REQUIRED TO PREVENT SPALLING OF CONCRETE AROUND HOLES.
- ⑦ PREVIOUS WALL MANUFACTURED ACCORDING TO STANDARD DRAWING RBM-115-07 MAY STILL BE USED. ANY NEW BARRIER WALL TYPE 9T MANUFACTURED SHALL COMPLY TO THIS SEPIA DRAWING.



- 1/2" THICK STEEL WASHER -

APPROXIMATE QUANTITIES

20'		
REINF.	CONC.	WEIGHT ④
LBS.	CU. YD./FT.	TONS
195	0.12	5.0

FOR TEMPORARY USE ONLY
KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE BARRIER
WALL TYPE 9T
(TEMPORARY)

STANDARD DRAWING NO. RBM-115-08
SUBMITTED: *David Kutt* 11-21-07
DIRECTOR DIVISION OF DESIGN DATE
APPROVED: *Matthew W. [Signature]* 11-21-07
STATE HIGHWAY ENGINEER DATE

NOTES

THE CONTRACT UNIT PRICE EACH FOR THE CURB TO BARRIER WALL TRANSITION SHALL INCLUDE CONCRETE, FORMS, STEEL REINFORCEMENT, EXPANSION JOINT MATERIAL, AND ALL INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION.

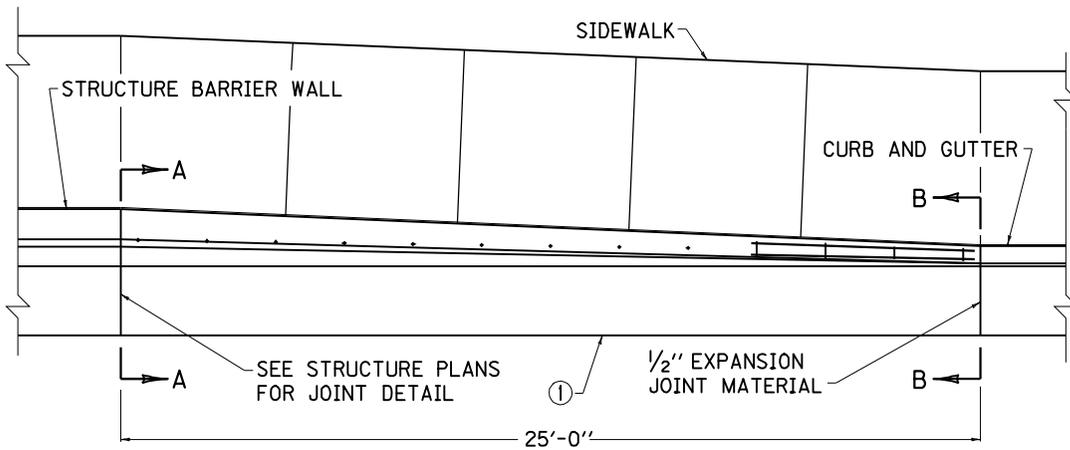
FOR ILLUSTRATION PURPOSES THE DETAILS DEPICT THE CURB TO BARRIER WALL TRANSITION CONNECTING TO A STANDARD CURB, HOWEVER THE CURB TO BARRIER WALL TRANSITION MAY BE CONSTRUCTED TO MATCH ANY ADJOINING CURB.

THE AMOUNT OF CLASS "A" CONCRETE REQUIRED FOR A TRANSITION SECTION WITH A 10 1/2" WIDE TOP IS APPROXIMATELY 2.61 CU. YDS.

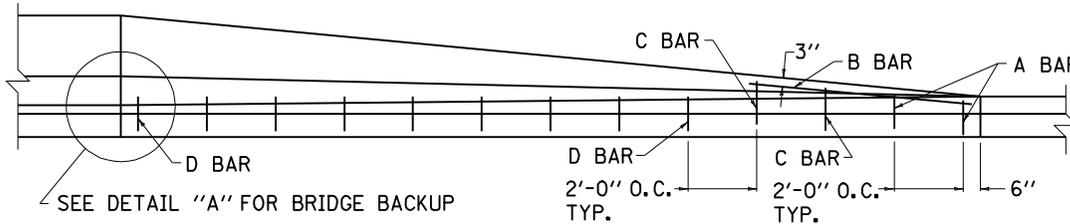
① WHEN THE CURB TO BARRIER WALL TRANSITION ABUTS RIGID PAVEMENT A LONGITUDINAL SAWED CONSTRUCTION JOINT SHALL BE INSTALLED IN ACCORDANCE WITH CURRENT STD. DWG. RPS-010.

② SEE STRUCTURE PLANS FOR DIMENSIONS.

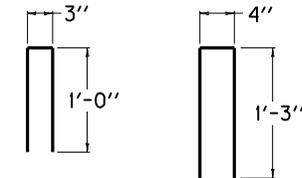
3. CURB TO BARRIER WALL TRANSITION MAY BE USED ON APPLICABLE STRUCTURES, WHEN THE OPERATING SPEED IS 45 MPH OR LESS.



PLAN VIEW

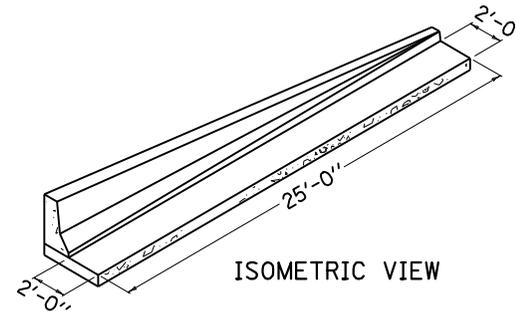


ELEVATION VIEW



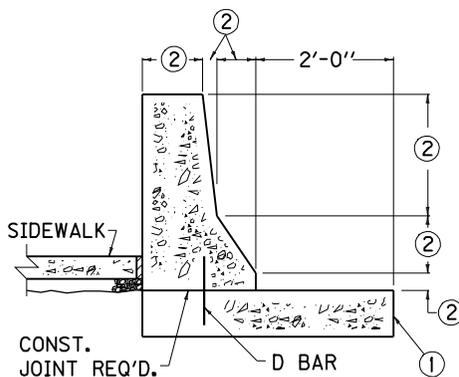
BAR A

BAR C



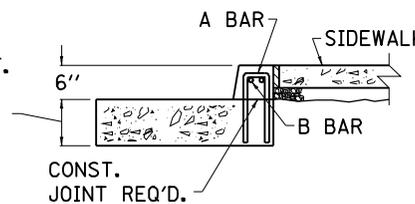
ISOMETRIC VIEW

BILL OF REINFORCEMENT				
BAR	QTY.	SIZE	LENGTH	TOTAL LBS. OF STEEL
A	2	5	2'-2"	48
B	2	5	6'-6"	
C	2	5	2'-9"	
D	9	8	1'-0"	



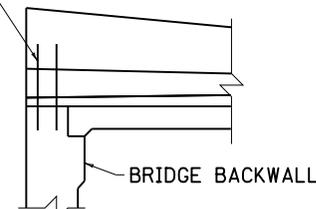
SECTION A-A

CONC. PVMT. THICKNESS OR 8" MIN.



SECTION B-B

SEE STRUCTURE PLANS FOR REINFORCEMENT DETAIL



DETAIL "A"

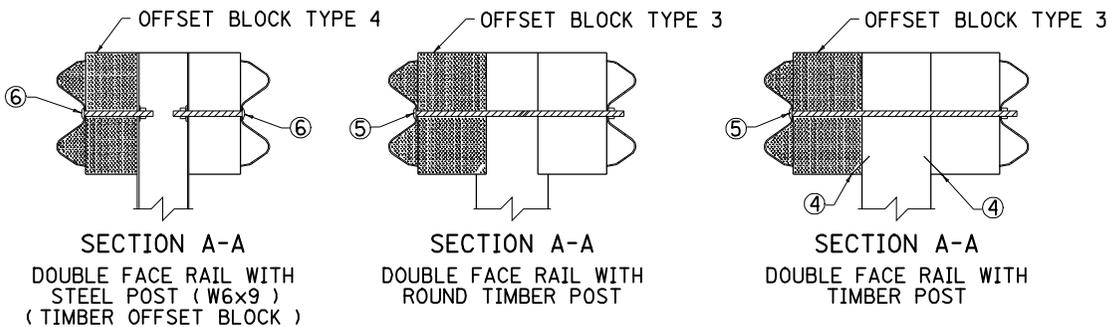
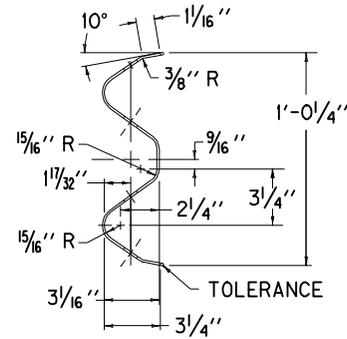
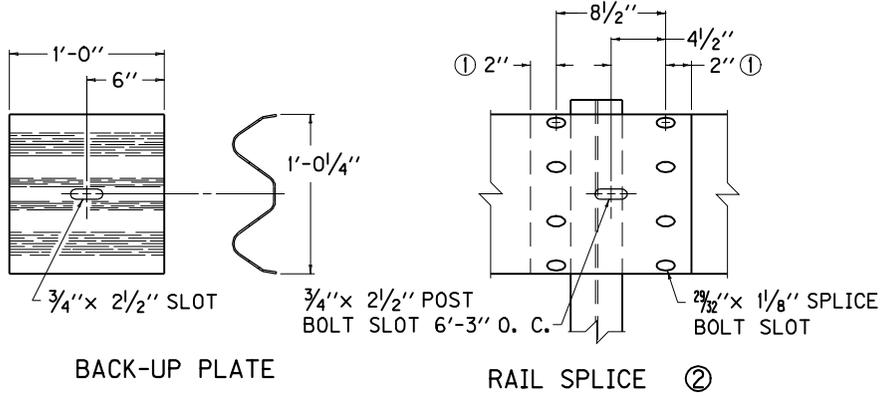
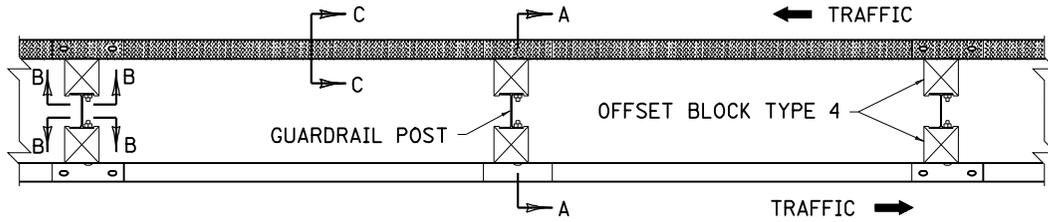
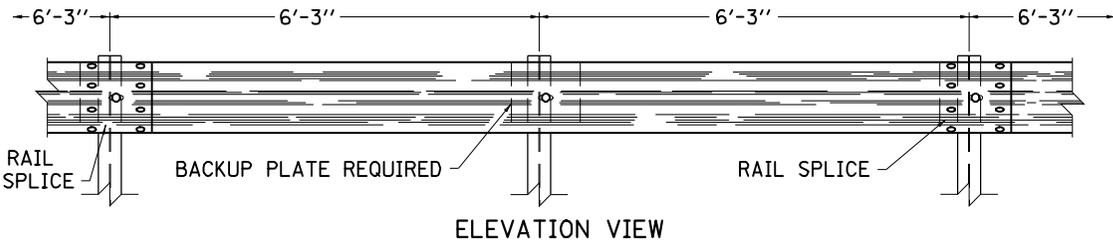
KENTUCKY DEPARTMENT OF HIGHWAYS

CURB TO BARRIER WALL TRANSITION

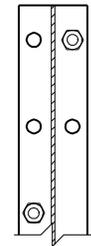
STANDARD DRAWING NO. RBM-130-03

SUBMITTED *John B. Anhalt* 12-1-99
DIRECTOR DIVISION OF DESIGN DATE

APPROVED *J. M. Howell* 12-1-99
STATE HIGHWAY ENGINEER DATE



- NOTES**
- THE CONTRACT UNIT PRICE BID SHALL BE:
 GUARDRAIL-STEEL W BEAM-SINGLE FACE - LIN. FT.
 OR
 GUARDRAIL-STEEL W BEAM-DOUBLE FACE - LIN. FT.
- DIMENSIONAL TOLERANCES NOT SHOWN OR IMPLIED ARE INTENDED TO BE THOSE CONSISTENT WITH THE PROPER FUNCTIONING OF THE PART, INCLUDING ITS APPEARANCE AND ACCEPTED MANUFACTURING PRACTICES.
- THE RAIL ELEMENT SHALL COMPLY WITH AASHTO M-180 -CLASS A, TYPE II.
- ALL LAPS SHALL BE PLACED IN THE DIRECTION OF TRAFFIC FLOW.
- ① TOLERANCE + 1/4", -1/4"
 - ② 8 - 5/8" x 1 1/4" LONG BUTTON HEAD BOLTS AND HEX HEAD RECESS NUTS REQUIRED FOR EACH RAIL SPLICE.
 - ③ LENGTH EQUALS POST AND BLOCK WIDTH PLUS: 2" FOR BOLT OR 2 1/4" FOR THREADED ROD.
 - ④ GALVANIZED STEEL 10d COMMON COATED NAIL (DRIVE NAIL AT THE TOP OR BOTTOM CENTER OF BLOCK AND POST AFTER BOLT IS INSTALLED).
 - ⑤ 5/8" x ③ STEEL THREADED ROD AND TWO (2) HEX HEAD NUTS OR 5/8" x ③ BUTTON OR HEX HEAD BOLT AND HEX HEAD NUT.
 - ⑥ 5/8" x 8" BUTTON HEAD BOLT, HEX HEAD RECESS NUT AND ONE 3/8" ROUND WASHER (TYP.). BOLT SHALL HAVE A MINIMUM THREAD LENGTH OF 2".
- REQUIRED FOR DOUBLE RAIL



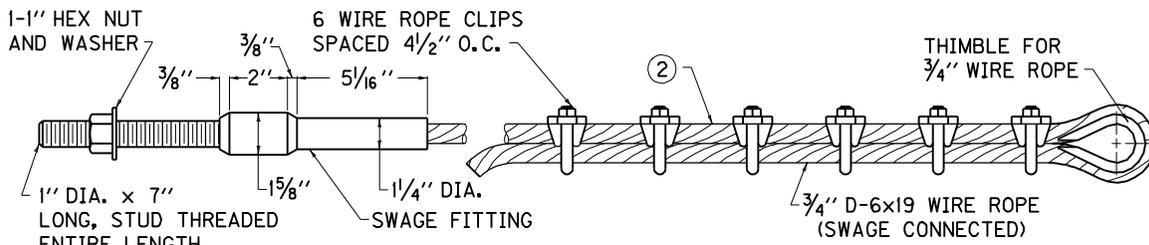
USE WITH CUR. STD. DWG. RBR-005

KENTUCKY
DEPARTMENT OF HIGHWAYS

STEEL BEAM
GUARDRAIL
("W" BEAM)

STANDARD DRAWING NO. RBR-001-11

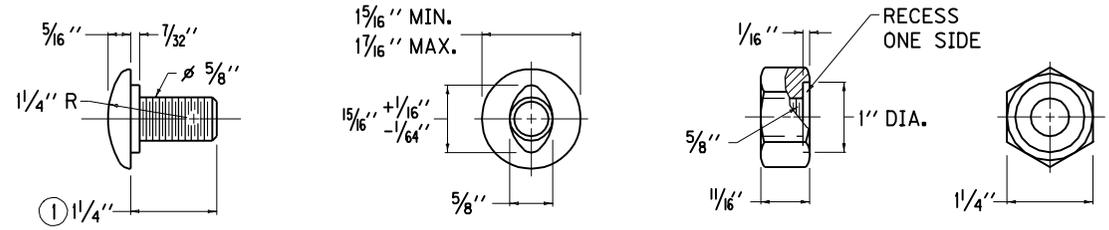
SUBMITTED <i>David Kutt</i>	11-21-07
DIRECTOR DIVISION OF DESIGN	DATE
APPROVED <i>Harold W. [Signature]</i>	11-21-07
STATE HIGHWAY ENGINEER	DATE



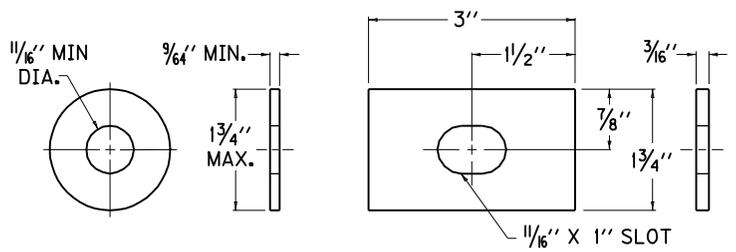
CABLE ASSEMBLY TYPE 3

NOTES

- ① RAIL BOLT SIMILAR EXCEPT LENGTH.
- ② CABLE ASSEMBLY TYPE 3 - GUARDRAIL END TREATMENT TYPE 2A
- ③ THE THRIE BEAM TO "W" BEAM CONNECTOR SHALL COMPLY WITH AASHTO M-180 CLASS A, TYPE 2 EXCEPT WHERE IN CONFLICT WITH THIS DETAIL.

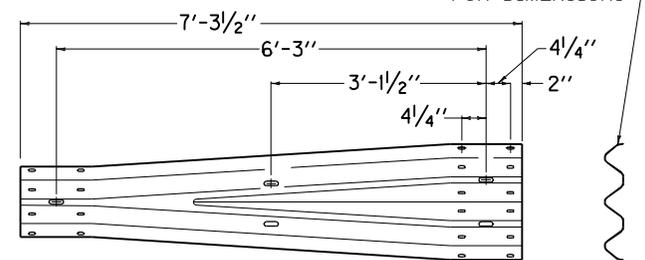


5/8" BUTTON HEAD BOLT AND RECESSED NUT



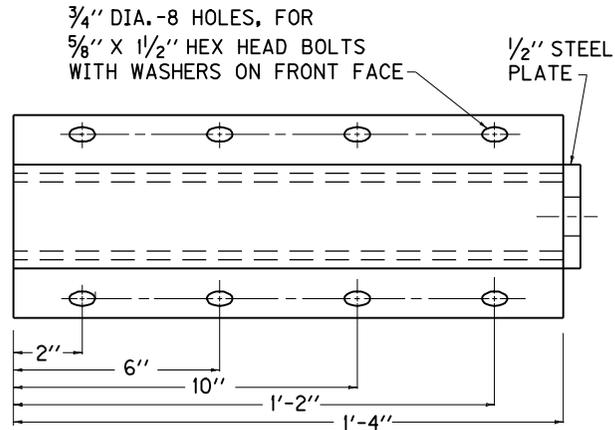
ROUND WASHER AND RECTANGULAR PLATE WASHER

SEE CUR. STD. DWG. RBR-001 FOR DIMENSIONS

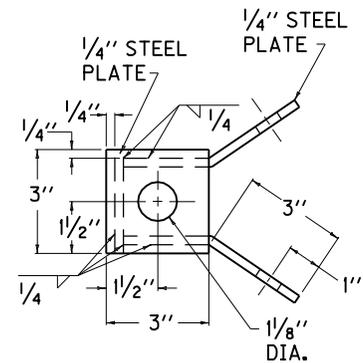


SEE CUR. STD. DWG. RBR-100 FOR DIMENSIONS

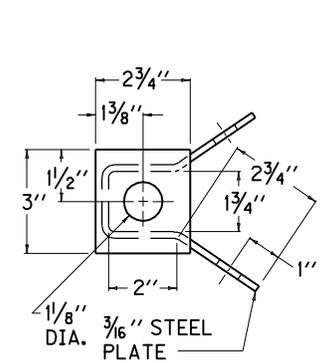
THRIE BEAM TO "W" BEAM CONNECTOR ③



RAIL ANCHOR ASSEMBLY



ALTERNATE NO. 1



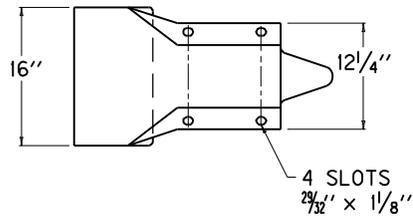
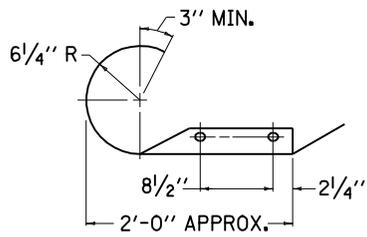
ALTERNATE NO. 2

KENTUCKY DEPARTMENT OF HIGHWAYS

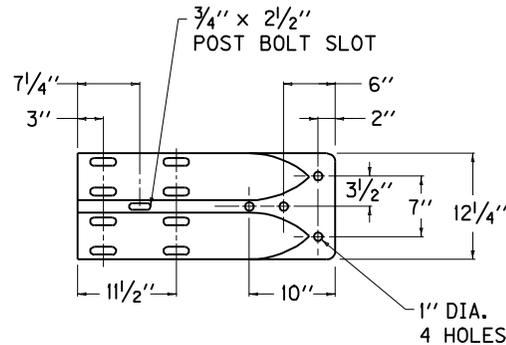
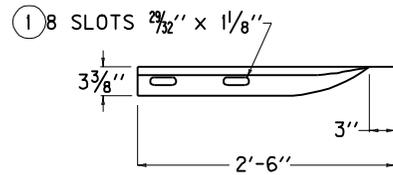
GUARDRAIL COMPONENTS

STANDARD DRAWING NO. RBR-005-10

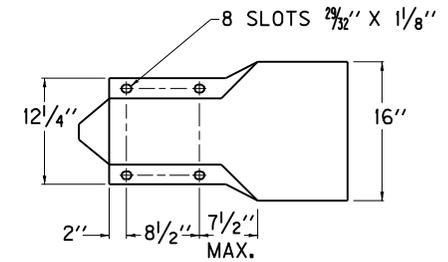
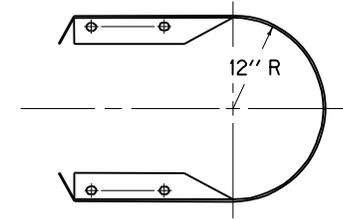
SUBMITTED *John B. Anshutz* 12-1-99
 DIRECTOR DIVISION OF DESIGN DATE
 APPROVED *J. M. Howell* 12-1-99
 STATE HIGHWAY ENGINEER DATE



TERMINAL SECTION NO. 1



TERMINAL SECTION NO. 2



TERMINAL SECT. NO. 3

NOTES

TERMINAL SECTIONS SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID EACH COMPLETE AND INSTALLED, EXCEPT WHEN INCIDENTAL TO OTHER BID ITEMS.

TERMINAL SECTIONS SHALL COMPLY WITH AASHTO M-180 AS FOLLOWS:

- a. TERMINAL SECTIONS NO. 1, 3, -CLASS A OR B, TYPE 2
- b. TERMINAL SECTION NO. 2-CLASS B, TYPE 2

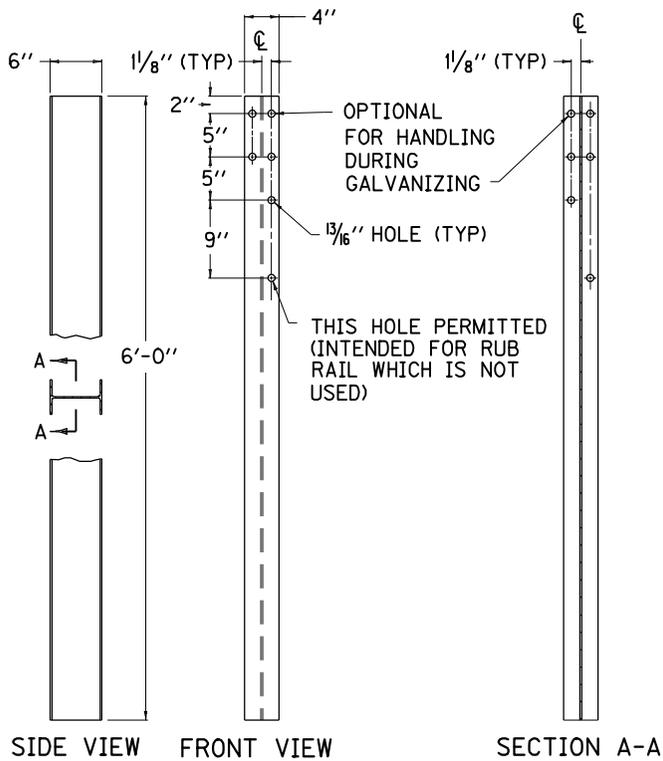
① WHEN SLOTTED HOLES ARE EXPOSED (8) EIGHT RECTANGULAR FLAT WASHERS SHALL BE REQUIRED-2" SPLICE BOLTS ARE TO BE USED IF NEEDED.

KENTUCKY
DEPARTMENT OF HIGHWAYS

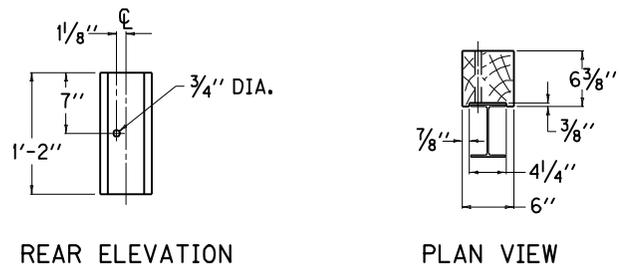
GUARDRAIL
TERMINAL SECTIONS

STANDARD DRAWING NO. RBR-010-05

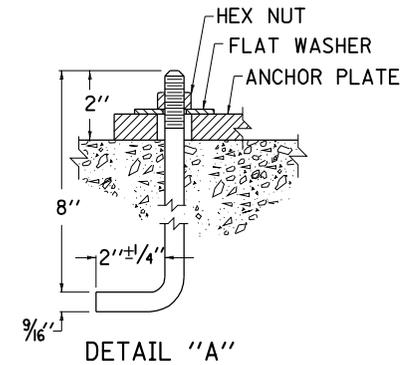
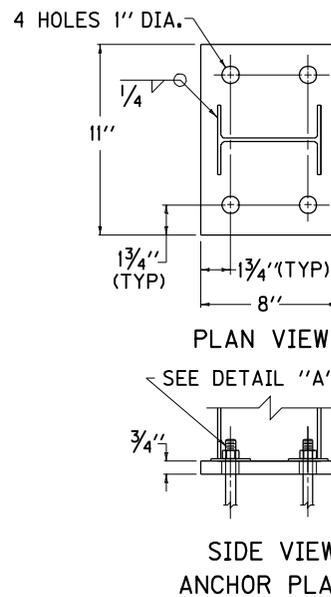
SUBMITTED *John B. Anagnost* 12-1-99
DIRECTOR DIVISION OF DESIGN DATE
APPROVED *J. M. Howell* 12-1-99
STATE HIGHWAY ENGINEER DATE



~ W6 X 9.0 STEEL POST ① ~



OFFSET BLOCK TYPE 4
(TIMBER)
(FOR USE WITH STEEL POST ONLY)



USE WITH CUR. STD. DWG. [RBR-016](#)

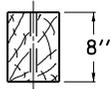
KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL POSTS

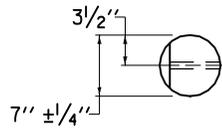
STANDARD DRAWING NO. RBR-015-04

SUBMITTED	<i>John B. Anshutz</i>	12-1-99
	DIRECTOR DIVISION OF DESIGN	DATE
APPROVED	<i>J. B. Anshutz</i>	12-1-99
	STATE HIGHWAY ENGINEER	DATE

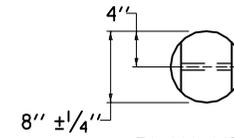
~ NOTES ~
① W6 X 8.5 IS AN ACCEPTABLE ALTERNATE.



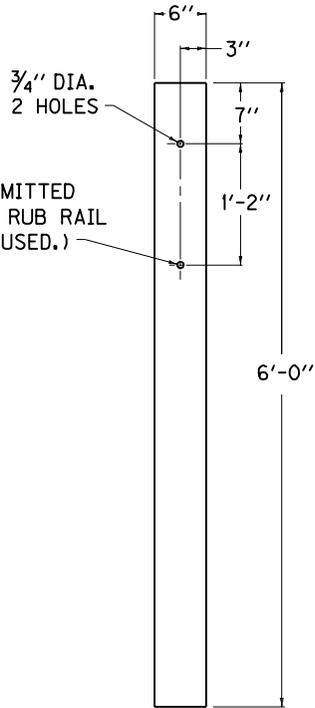
PLAN VIEW



PLAN VIEW

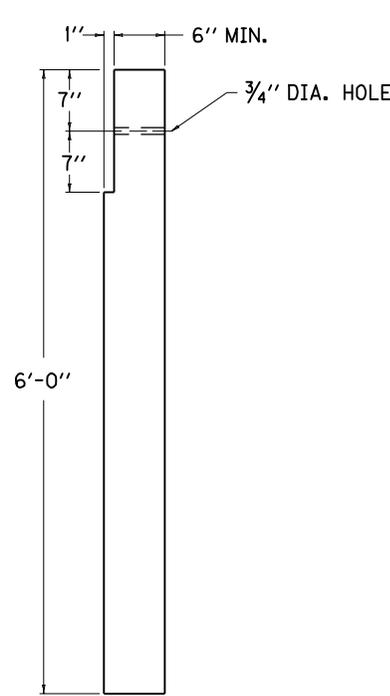


PLAN VIEW

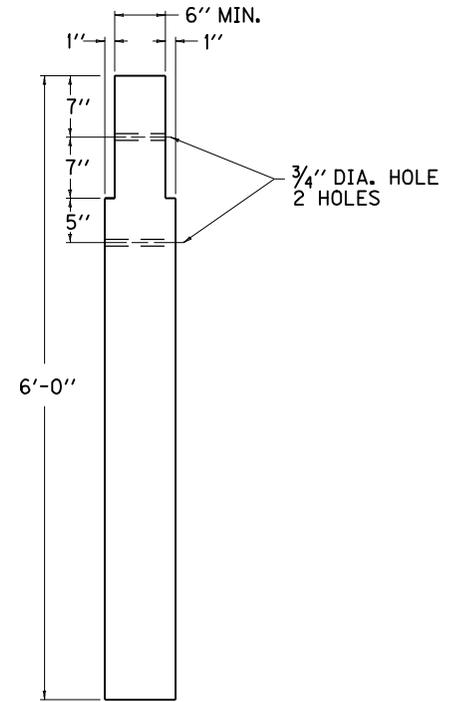


THIS HOLE PERMITTED
(INTENDED FOR RUB RAIL
WHICH IS NOT USED.)

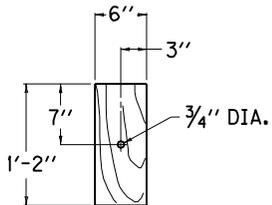
FRONT ELEVATION
6"x8" TIMBER POST



7" ROUND TIMBER POST
(SINGLE FACE RAIL)



8" ROUND TIMBER POST
(DOUBLE FACE RAIL)



FRONT ELEVATION
OFFSET BLOCK TYPE 3
(6" X 8" TIMBER)
(FOR USE WITH RECTANGULAR
AND ROUND POSTS)

USE WITH CUR. STD. DWG. [RBR-015](#)

KENTUCKY
DEPARTMENT OF HIGHWAYS

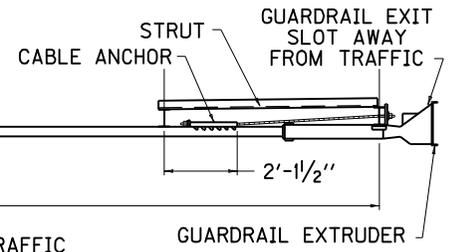
GUARDRAIL POSTS

STANDARD DRAWING NO. RBR-016-04

SUBMITTED	<i>David Kutt</i>	11-21-07
	DIRECTOR DIVISION OF DESIGN	DATE
APPROVED	<i>Matthew W. [Signature]</i>	11-21-07
	STATE HIGHWAY ENGINEER	DATE

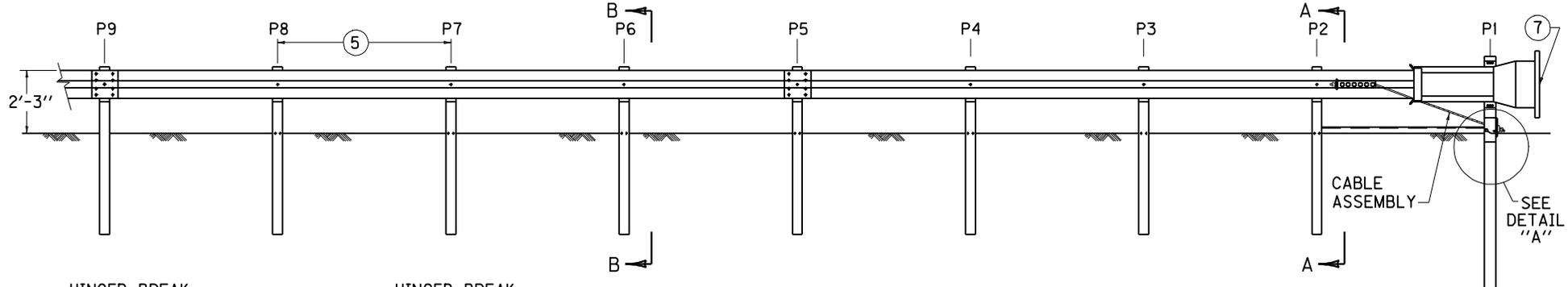
NORMAL
GUARDRAIL
INSTALLATION

LENGTH OF NEED



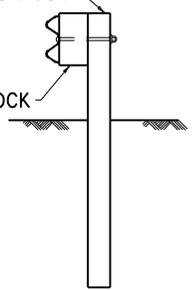
PAY LIMITS (50'-0'')

← TRAFFIC



HINGED BREAK
AWAY OR
STEEL YIELDING
TERMINAL POST

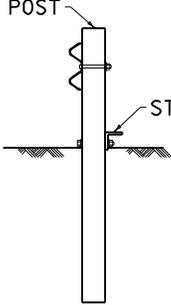
WOOD
OFFSET BLOCK



SECTION B-B
(POSTS P3 THRU P8)

HINGED BREAK
AWAY OR
STEEL YIELDING
TERMINAL POST

STRUT

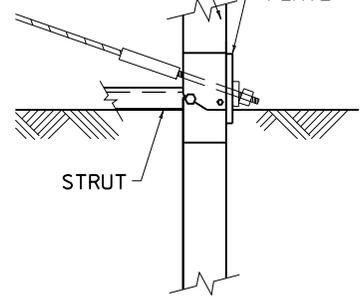


SECTION A-A
(POST P2)

HINGED BREAK
AWAY POST

BEARING
PLATE

STRUT



DETAIL "A"

USE WITH CUR. STD.
DWG. RBI-004

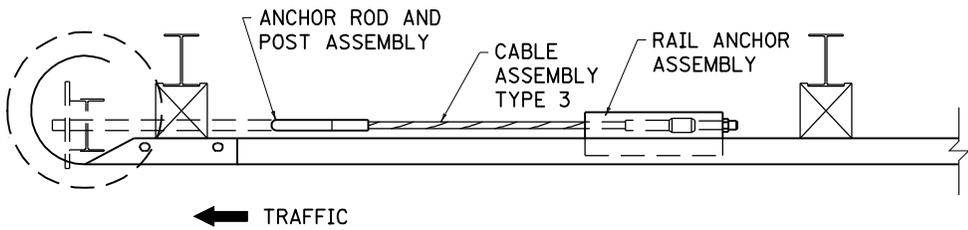
KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL
END TREATMENT
TYPE 1

STANDARD DRAWING NO. RBR-020-03

SUBMITTED *David Kutt* 11-21-07
DIRECTOR DIVISION OF DESIGN DATE
APPROVED *Matthew A. Anderson* 11-21-07
STATE HIGHWAY ENGINEER DATE

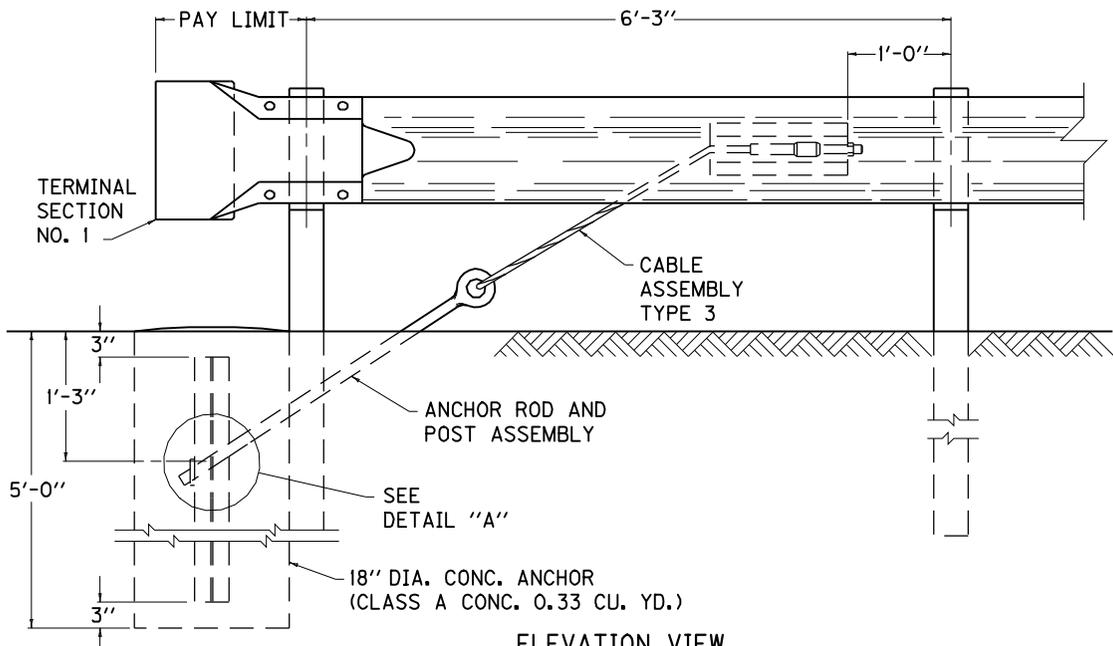
1. GUARDRAIL END TREATMENT TYPE 1 SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND INCLUDES POSTS, RAIL ELEMENTS, GUARDRAIL EXTRUDER AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION AS DETAILED.
2. PERMISSIBLE ALTERNATES FOR GUARDRAIL END TREATMENT TYPE 1 ARE PATENTED ITEMS: ET PLUS MANUFACTURED BY TRINITY INDUSTRIES OF GIRARD, OHIO OR SKT-350 MANUFACTURED BY ROAD SYSTEMS INC. OF BIG SPRINGS, TEXAS.
3. THE MANUFACTURER SHALL FURNISH TWO (2) SETS OF SHOP PLANS TO THE CONTRACTOR WITH EACH INSTALLATION.
4. THE COMPLETED INSTALLATION SHALL MEET ALL APPLICABLE REQUIREMENTS OF THE MANUFACTURER (SEE SHOP DRAWINGS).
- ⑤ POSTS P1 THROUGH P9 ARE SPACED 6'-3" ON CENTER.
6. INTENDED USE: AREAS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL.
- ⑦ OBJECT MARKER TYPE 3 (SEE CURRENT MUTCD MANUAL FOR DETAILS)



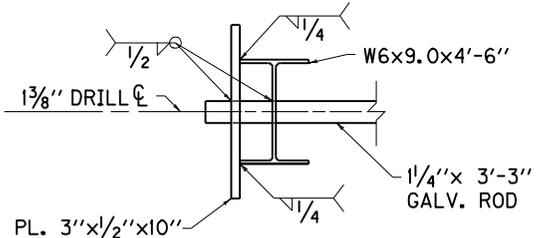
PLAN VIEW

NOTES

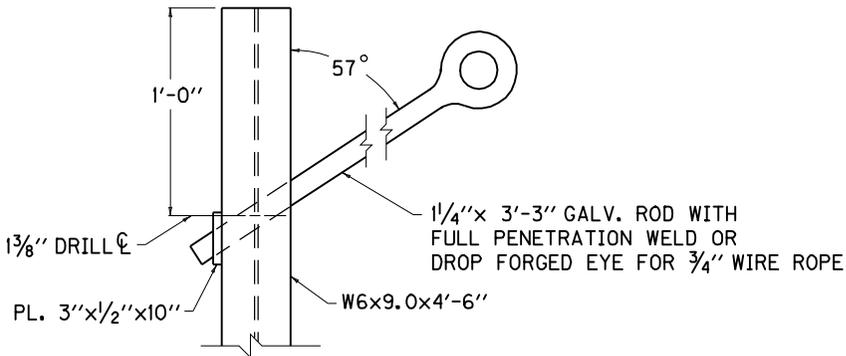
1. GUARDRAIL END TREATMENT TYPE 2A SHALL BE TO THE PAY LIMITS AS DETAILED AND THE CONTRACT UNIT PRICE BID EACH SHALL INCLUDE TERMINAL SECTION NO. 1, CLASS A CONCRETE, RAIL ANCHOR ASSEMBLY, CABLE ASSEMBLY TYPE 3, ANCHOR ROD AND POST ASSEMBLY, AND ALL THE INCIDENTALS NECESSARY FOR A COMPLETE INSTALLATION AS DETAILED.
2. IN THE EVENT SOLID ROCK IS ENCOUNTERED IN THE ANCHOR, THE POST (SEE DETAIL "A") MAY BE SHORTENED, PROVIDED IT EXTENDS INTO THE SOLID ROCK A MINIMUM OF 3 FEET.
3. FORM THE TOP 4" OF THE CONCRETE ANCHOR AND CROWN 1/2" TO DRAIN. A CONSTRUCTION JOINT WILL NOT BE PERMITTED IN THE ANCHOR.



ELEVATION VIEW



DETAIL "A"



ANCHOR ROD AND POST ASSEMBLY

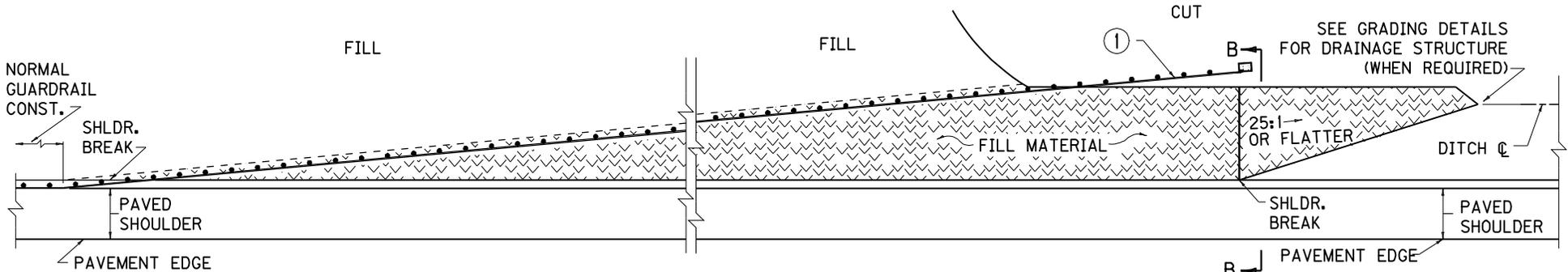
USE WITH CURRENT STANDARD DRAWINGS: RBR-005, RBR-010, RBI-001, RBI-002, RBI-003

KENTUCKY DEPARTMENT OF HIGHWAYS

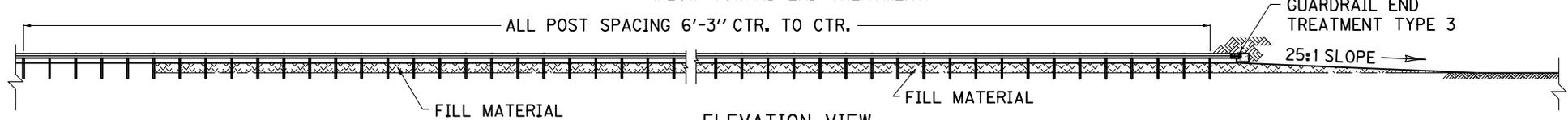
GUARDRAIL END TREATMENT TYPE 2A

STANDARD DRAWING NO. RBR-025-03

SUBMITTED	<i>John B. ...</i>	12-1-99
DIRECTOR DIVISION OF DESIGN		DATE
APPROVED	<i>[Signature]</i>	12-1-99
STATE HIGHWAY ENGINEER		DATE



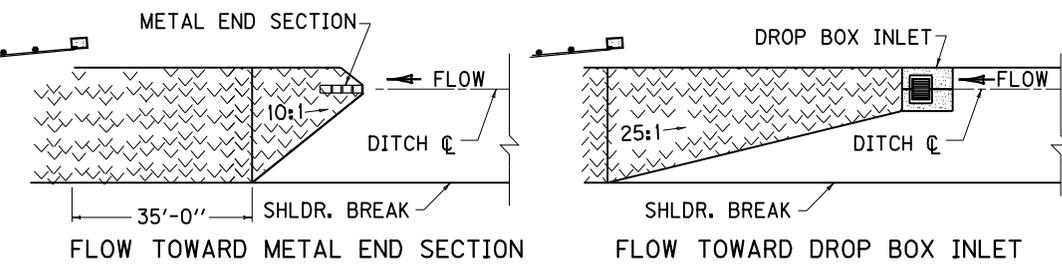
PLAN VIEW
(FLOW TOWARD END TREATMENT)



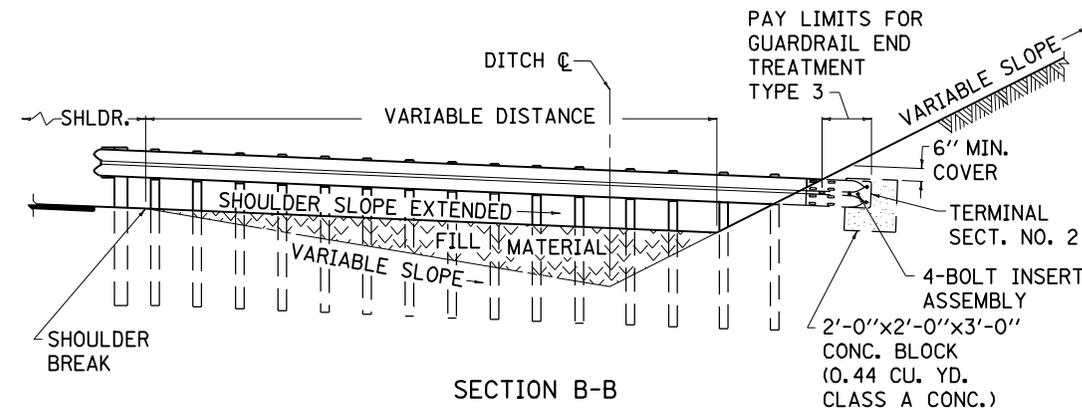
ELEVATION VIEW

NOTES

1. THE CONTRACT UNIT PRICE FOR GUARDRAIL END TREATMENT TYPE 3 SHALL INCLUDE THE CONCRETE BLOCK, TERMINAL SECTION NO. 2, FOUR BOLT INSERT ASSEMBLY AND ALL INCIDENTALS NECESSARY TO COMPLETE THE WORK.
2. BID ITEMS AND UNIT TO BID:
 - A. GUARDRAIL END TREATMENT TYPE 3 - EACH
 - B. ROADWAY OR BORROW EXCAVATION, OR EMBANKMENT IN PLACE - CU. YD.
 - C. DRAINAGE STRUCTURE BID SEPARATELY.
3. OFFSET BLOCKS MAY BE ELIMINATED ON ANY POST THAT IS COMPLETELY BELOW GRADE.
4. SEE CUR. STD. DWG. [RBC-100](#) FOR 4-BOLT INSERT ASSEMBLY DETAILS.



GRADING DETAILS



SECTION B-B

	①		
DESIGN SPEED	70+ MPH	60 MPH	50 MPH OR LESS
FLARE RATES	15:1	13:1	11:1

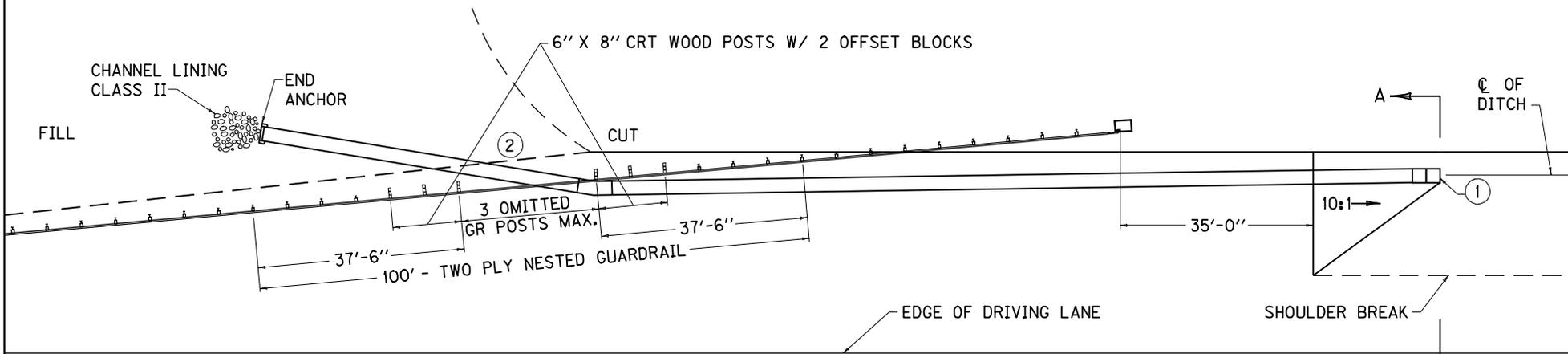
USE WITH CUR. STD. DWGS.
[RBC-100](#), [RDB-005](#)

KENTUCKY
DEPARTMENT OF HIGHWAYS

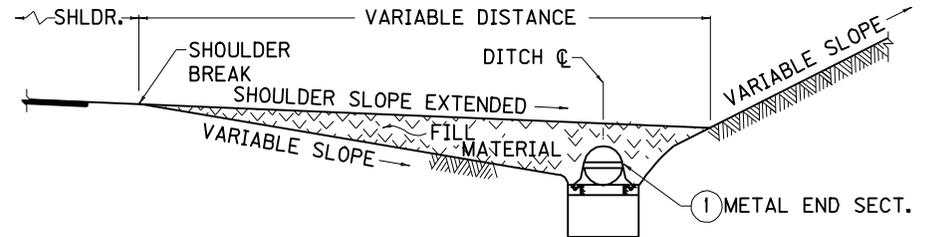
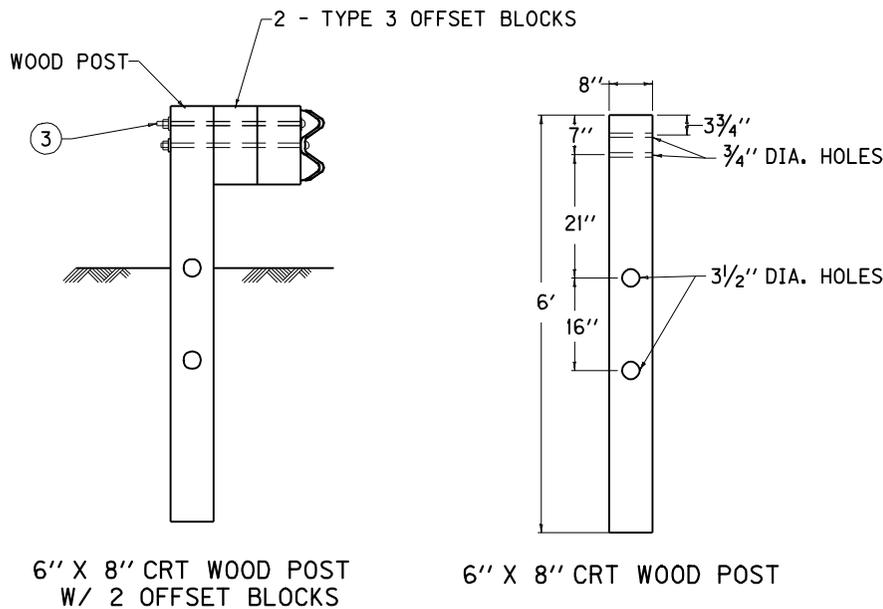
GUARDRAIL END
TREATMENT TYPE 3

STANDARD DRAWING NO. RBR-030-04

SUBMITTED: *Alan W. Shupe* 12-2-02
DIRECTOR DIVISION OF DESIGN DATE
APPROVED: *J. M. Howell* 12-2-02
STATE HIGHWAY ENGINEER DATE



PLAN VIEW



SECTION A-A

NOTES

- ① SEE CURRENT STANDARD DRAWING **RDB-150** AND **RDB-160** FOR METAL END SECTIONS.
- ② A MINIMUM DISTANCE OF 5'-0" BEHIND THE RAIL SHALL BE CLEAR OF ANY FIXED OBJECT HAZARDS.
- ③ 1 - 5/8" DIA. BOLT WITH TWO ROUND WASHERS.
4. BID ITEMS AND UNIT TO BID:
 - A. CHANNEL LINING CLASS II - TON
 - B. END ANCHOR - CU. YD.
 - C. PIPE - L.F.
 SEE CURRENT STANDARD DRAWING **RBR-030** FOR OTHER BID ITEMS.

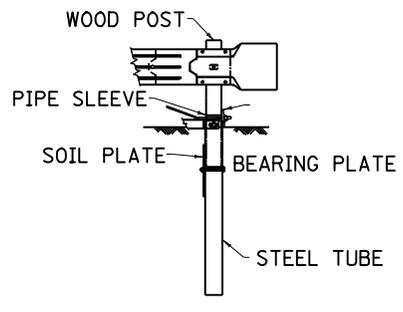
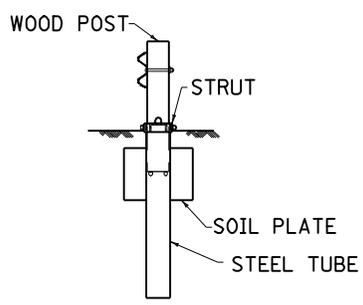
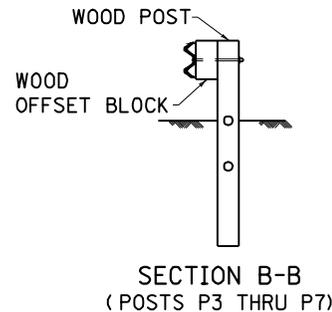
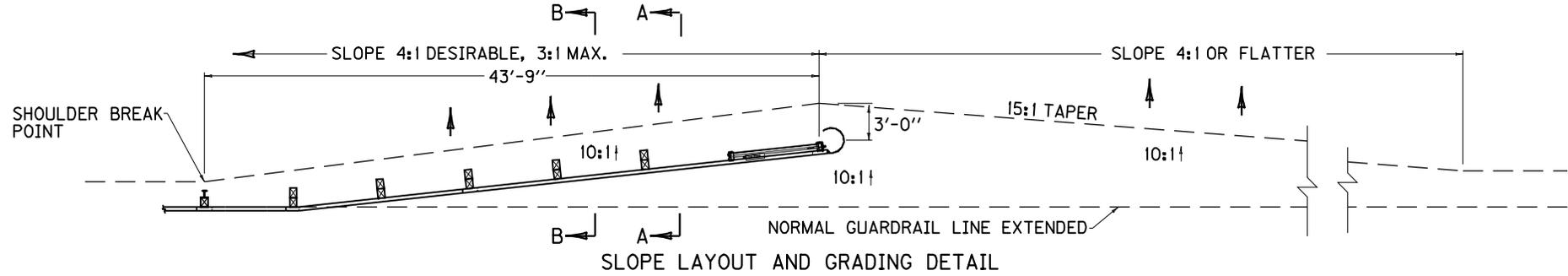
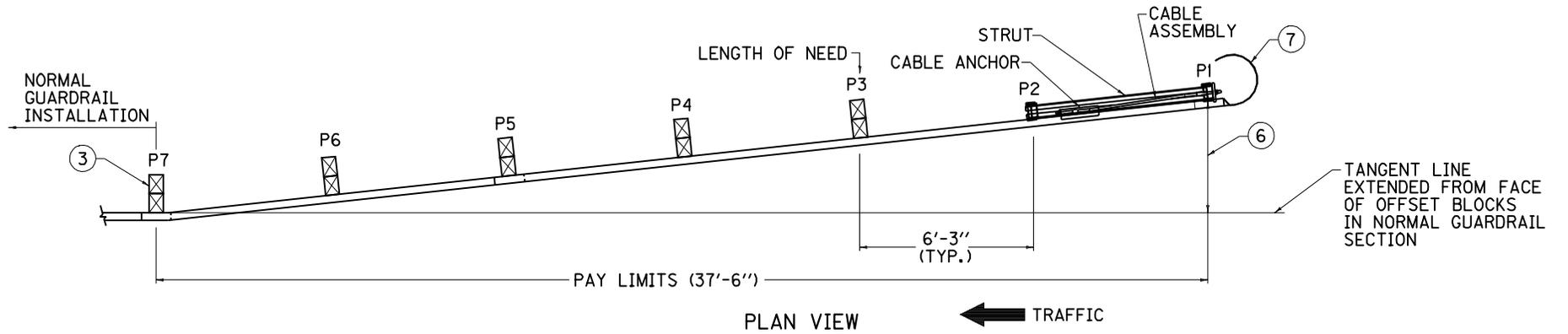
USE WITH CUR. STD. DWGS.
RDY-060, **RDY-065**, **RBR-030**,
RDB-150 AND **RDB-160**

KENTUCKY
 DEPARTMENT OF HIGHWAYS

GUARDRAIL END
 TREATMENT TYPE 3
 PIPE DRAINAGE DETAIL

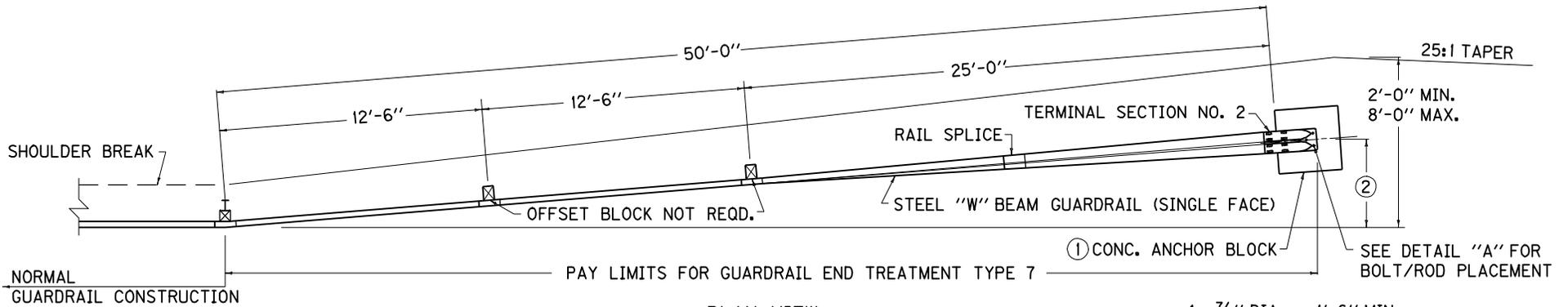
STANDARD DRAWING NO. **RBR-031**

SUBMITTED	<i>David Knott</i>	11-21-07
APPROVED	DIRECTOR DIVISION OF DESIGN <i>Madison Woodward</i>	DATE 11-21-07
	STATE HIGHWAY ENGINEER	DATE

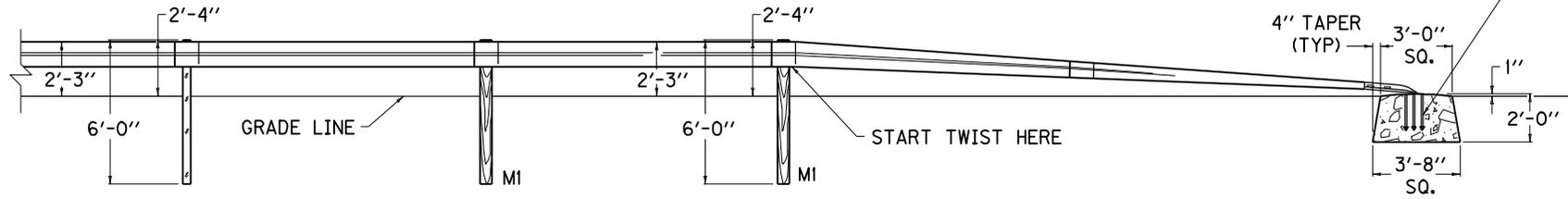


1. BID ITEMS AND UNIT TO BID:
 - A. GUARDRAIL END TREATMENT TYPE 4A - EACH
 - B. MATERIAL USED TO CONSTRUCT WIDENING SHALL BE BID AS ROADWAY OR BORROW EXCAVATION OR EMBANKMENT-IN-PLACE AT THE CONTRACT UNIT PRICE PER CUBIC YARD.
2. INTENDED USE: AREAS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL.
- ③ POST P7 SHALL BE A CRT BREAKAWAY WOOD POST.
4. GUARDRAIL END TREATMENT TYPE 4A IS A PATENTED (ONE SOURCE) PRODUCT MANUFACTURED BY TRINITY INDUSTRIES, INC. OF DALLAS, TX. OR ROAD SYSTEMS, INC. OF BIG SPRING, TX.
5. THE MANUFACTURER SHALL FURNISH TWO (2) SETS OF SHOP PLANS TO THE CONTRACTOR WITH EACH INSTALLATION.
- ⑥ SYSTEM OFFSET OF 4'-0" SHALL BE MEASURED FROM FACE OF OFFSET BLOCK AT NORMAL GUARDRAIL SECTION TO FACE OF POST AT P1.
- ⑦ OBJECT MARKER TYPE 3 (SEE CURRENT MUTCD MANUAL FOR DETAILS).

KENTUCKY DEPARTMENT OF HIGHWAYS	
GUARDRAIL END TREATMENT TYPE 4A	
STANDARD DRAWING NO. RBR-035-08	
SUBMITTED <i>David Kutt</i>	11-21-07 DATE
APPROVED <i>Matthew M. [Signature]</i>	11-21-07 DATE
DIRECTOR DIVISION OF DESIGN	STATE HIGHWAY ENGINEER



PLAN VIEW



ELEVATION VIEW

4 - 7/8" DIA. x 1'-6" MIN. ANCHOR BOLTS
 ---OR---
 THREADED RODS (HEX NUTS AND FLAT WASHERS)

NOTES

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

GUARDRAIL END TREATMENT TYPE 7 SHALL BE TO THE PAY LIMITS AS DETAILED AND THE CONTRACT UNIT PRICE EACH SHALL INCLUDE TERMINAL SECTION NO. 2, STEEL "W" BEAM GUARDRAIL (SINGLE FACE), GUARDRAIL POSTS MI, CONCRETE ANCHOR BLOCK, EXCAVATION, LABOR, HARDWARE AND INCIDENTALS NECESSARY FOR THE INSTALLATION.

CONSTRUCTION REQUIREMENTS

SPLICE BOLTS AT TERMINAL SECTION NO. 2 SHALL BE LOOSELY TIGHTENED AND CENTERED TO ALLOW MAXIMUM MOVEMENT DUE TO EXPANSION. ONE (1) 1 1/8" ROUND WASHER AND ONE (1) RECTANGULAR PLATE WASHER REQUIRED FOR EACH SPLICE BOLT, AT TERMINAL SECTION NO. 2.

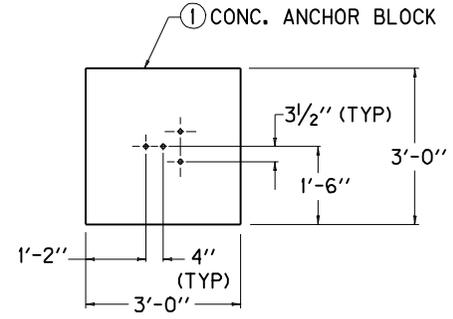
- ① THE CONCRETE ANCHOR BLOCK MAY BE PRECAST OR CAST-IN-PLACE. WHEN THE CONCRETE ANCHOR BLOCK IS CAST-IN-PLACE FORMING OF THE SIDES SHALL BE REQUIRED.
- ② ON ALL NEW ROADWAYS THE OFFSET DISTANCE SHALL BE 4'-0". ON ALL EXISTING ROADWAYS THE OFFSET DISTANCE MAY VARY FROM ZERO FEET MINIMUM TO A DESIRABLE 4'-0" MAXIMUM.

MATERIAL REQUIREMENTS

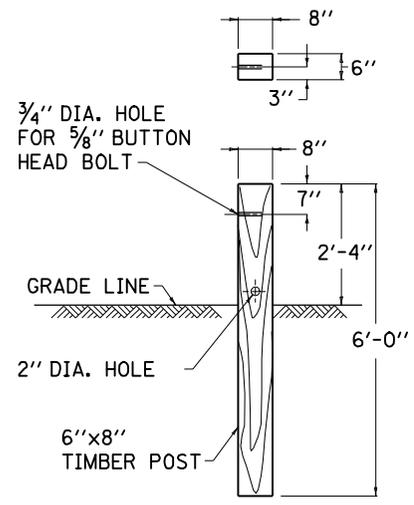
SEE CURRENT STD. DWG. RBR-001, RBR-005, RBR-010, AND RBR-015 FOR APPLICABLE DETAILS AND SPECIFICATIONS.

APPROX. QUANTITY FOR ANCHOR BLOCK: 0.83 CU. YD. CLASS "A" CONCRETE FOR TYPE 7 INSTALLATION.

- 3. THIS GUARDRAIL END TREATMENT SHALL ONLY BE USED ON LOW SPEED (45 MPH OR LESS) AND LOW VOLUME (LESS THAN 6,000 ADT) RURAL ROADS WITHOUT ADEQUATE ROOM FOR OTHER APPROVED END TREATMENTS.



DETAIL "A"



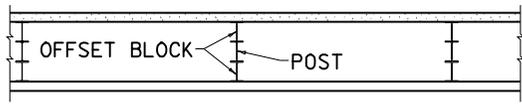
MI POST DETAIL

KENTUCKY
 DEPARTMENT OF HIGHWAYS

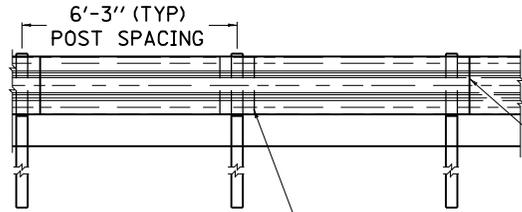
GUARDRAIL
 END TREATMENT
 TYPE 7

STANDARD DRAWING NO. RBR-050-05

SUBMITTED: *David Kutt* 11-21-07
 DIRECTOR DIVISION OF DESIGN DATE
 APPROVED: *Matthew A. [Signature]* 11-21-07
 STATE HIGHWAY ENGINEER DATE



PLAN VIEW



ELEVATION VIEW

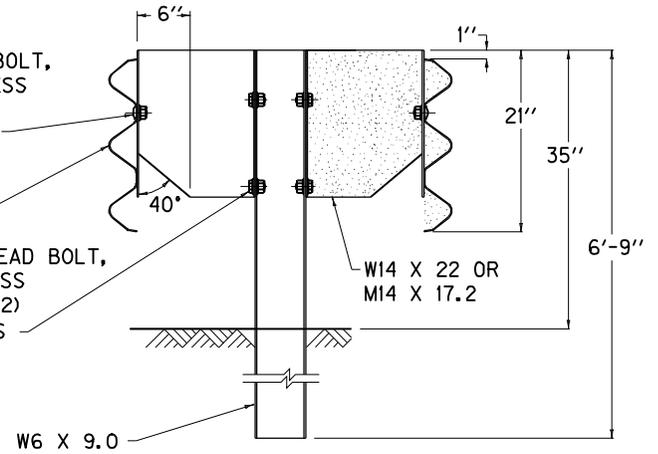
ALL LAPS SHALL BE IN DIRECTION OF TRAFFIC FLOW

BACK-UP PLATE (LOCATE AT INTERMEDIATE POSTS WHERE SPLICES DO NOT OCCUR)

5/8"x2" BUTTON HEAD BOLT, HEX HEAD RECESS NUT AND ONE ROUND WASHER

CLASS A TYPE II THRIE BEAM

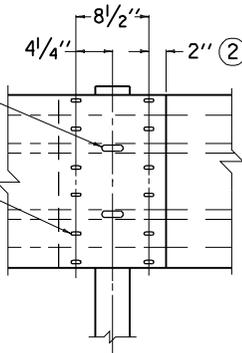
5/8"x1/2" HEX HEAD BOLT, HEX HEAD RECESS NUT AND TWO (2) ROUND WASHERS



NEW CONSTRUCTION

POST BOLT SLOTS 3/4"x2 1/2"x6'-3" O.C.

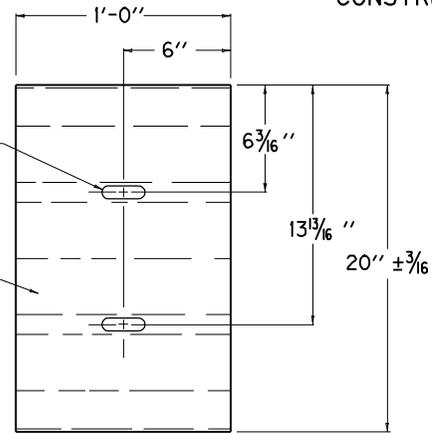
SPLICE BOLT SLOTS 2 3/32"x1 1/8"



① RAIL SPLICE

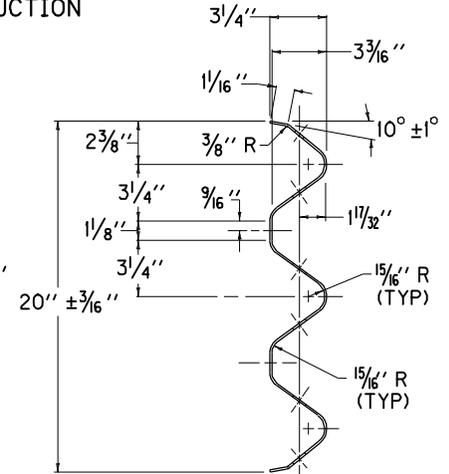
CLASS A TYPE II THRIE BEAM

SLOTS 3/4"x2 1/2"



BACK-UP PLATE

NOTES



SECTION OF RAIL ELEMENT & BACK-UP PLATE

BID ITEM AND UNIT TO BID-

STEEL THRIE BEAM GUARDRAIL (SINGLE FACE) - LIN. FT.

STEEL THRIE BEAM GUARDRAIL (DOUBLE FACE) - LIN. FT.

DIMENSIONAL TOLERANCES NOT SHOWN OR IMPLIED ARE INTENDED TO BE THOSE CONSISTENT WITH THE PROPER FUNCTIONING OF THE PART, INCLUDING ITS APPEARANCE AND ACCEPTED MANUFACTURING PRACTICES.

THE SAME TYPE OF RAIL ELEMENT, POST, FASTENINGS AND ACCESSORIES SHALL BE USED THROUGHOUT THE WORK.

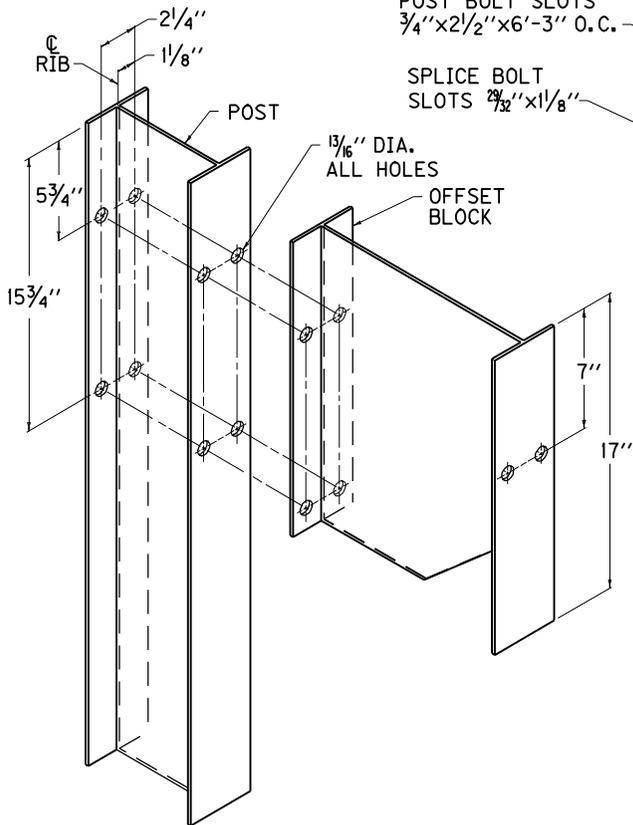
CONNECT OFFSET BLOCK TO STEEL POST WITH TWO DIAGONALLY LOCATED BLOTS.

① 12 - 5/8"x 1/4" BUTTON HEAD BOLTS AND HEX HEAD RECESS NUTS.

② TOLERANCE + 1/4", - 3/16"

AASHTO M-180 SHALL APPLY EXCEPT WHERE IN CONFLICT WITH THIS DRAWING.

REQUIRED FOR DOUBLE RAIL NOT REQUIRED FOR SINGLE RAIL.



POST & OFFSET BLOCK DETAIL

USE WITH CURRENT STD. DWG. RBR-005

KENTUCKY DEPARTMENT OF HIGHWAYS

STEEL BEAM GUARDRAIL (THRIE BEAM)

STANDARD DRAWING NO. RBR-100-05

SUBMITTED *John B. Anshutz* 12-1-99
DIRECTOR DIVISION OF DESIGN DATE

APPROVED *J. M. Howell* 12-1-99
STATE HIGHWAY ENGINEER DATE